RELATIONSHIPS BETWEEN BLOCK PLAY AND THE SOCIAL DEVELOPMENT OF KINDERGARTEN CHILDREN

BY

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This dissertation is dedicated to
my family--
Amy, Gail, and Nora.

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This naturalistic observational study investigated the social behavior of kindergarten children as they played with unit (small, solid, hardwood blocks) and large hollow blocks. The subjects, 10 boys and 10 girls, were observed in a university laboratory school kindergarten classroom, whose population is representative of the population of Florida.

The children were observed in assigned groups of two boys and two girls each. The children were observed for a total of 60 minutes per child, 30 minutes for each type of blocks. Every child was observed on eight occasions, four for unit and four for large hollow blocks. Two observers each observed two children for alternating 15 seconds. The observer first recorded one child's behavior for 15 seconds, then observed the second child following the same procedure,

until 7 1/2 minutes of data per child were collected for each occasion.

A 2 (type of blocks) x 2 (sex) x 4 (time) completely repeated measures ANOVA was used to analyze the data. All variables were tested at a .05 level of significance. The findings indicated the following. (1) The children in this study engaged in more group play with large hollow blocks and more parallel and solitary play with unit blocks. (2) The children spent more time with large hollow blocks. (3) The children exhibited similar social behavior with the two types of blocks although the behavior usually occurred more frequently with large hollow which might have been because the children spent more time with large hollow blocks. (4) No sex differences were found in the levels of social participation, the social behavior, or the amount of time these children spent with the two types of blocks. However, the small sample of children from only one classroom suggests a need for further investigation of this finding. (5) Many behaviors traditionally considered antisocial were rarely or never observed. These behaviors included taking blocks from another child, hitting, throwing blocks at others, and fighting. The results from this study indicated that both unit and large hollow block play may provide many opportunities for different kinds of social behavior and different levels of social play.

CHAPTER I
INTRODUCTION

Block play has been an integral part of the kindergarten curriculum since the kindergarten reform movement of the early 1900s (Robinson & Spodek, 1965). The invention of unit blocks (small, solid, hardwood blocks) by Pratt and the influence of Johnson's 1933 book The Art of Blockbuilding were instrumental reasons for the initial popularity of blocks as a kindergarten play material in the United States (Hirsch, 1974). Today unit blocks and large hollow blocks are still common equipment in most American kindergartens (Bender, 1978; Benish, 1978; Cohen & Rudolph, 1977; Maxim, 1980; Robinson & Spodek, 1965).

Blocks have been described as the "most important" material found in a preschool or kindergarten classroom (Benish, 1978; Starks, 1960). Their adaptable qualities provide children with "opportunities for growth" and the choice of playing alone or with a group (Starks, 1960). Blocks are "nonthreatening" and a more desirable material for children who feel uncomfortable with messy materials such as clay and fingerpaints (Cartwright, 1974). Early childhood educators maintain blocks can stimulate physical, cognitive, emotional, and social development (Benish, 1978; Cartwright,

1974; Hirsch, 1974; Layman, 1940; Tarrants, 1950; Winston & Fleiss, 1966).

The selection of play materials which encourage the development of the child is a major role of the kindergarten teacher. If blocks are capable of providing opportunities for practicing social skills, then it is important for the teacher to know the potential of this material for enhancing specific learning situations. A better understanding of the relationships between kindergarten children's block play and their social development will provide teachers with the information necessary to make curricular decisions that promote the social growth of kindergarten children.

Statement of the Problem

This study investigated the social behavior that occurred while kindergarten children played with unit and large hollow blocks. The results provide information about the levels of social participation and specific social behaviors that may occur when kindergarten children play with these two types of blocks. This information adds to the present knowledge of the value of blocks as a play material and the relationships between block play and the social development of the kindergarten child.

Specifically, the purpose of this study was to examine the following research questions:

1. What levels of social participation occur as kindergarten children play with unit and large hollow blocks?
2. What social behaviors occur as kindergarten children play with unit and large hollow blocks?
3. What are the differences and similarities between (a) the levels of social participation, (b) the block area participation, and (c) the social behaviors of kindergarten children as they play with unit and large hollow blocks?
4. What are the differences and similarities between (a) the levels of social participation, (b) the block area participation, and (c) the social behaviors of kindergarten boys and kindergarten girls as they play with unit blocks?
5. What are the differences and similarities between (a) the levels of social participation, (b) the block area participation, and (c) the social behaviors of kindergarten boys and kindergarten girls as they play with large hollow blocks?

Definition of Terms

Social Behavior is any action, facial expression, verbalization or vocalization by one child while interacting

with or in the presence of (within three feet) at least one other child. This category includes behaviors that are both antisocial and prosocial. The specific behaviors to be observed are defined in Chapter III.

Social Participation is the degree of play involvement and interaction with others, as exhibited by a child in the block area. Six levels of social participation have been adapted from Parten (1932). They are: (1) Inside Structure, (2) Unoccupied, (3) Onlooker, (4) Solitary, (5) Parallel, and (6) Group. These levels of social participation are defined in Chapter III.

Block Area Participation is the amount of time a child spends in each block area.

Unit Blocks are solid, hardwood blocks of which the basic "unit" is twice as wide as it is thick, and twice as long as it is wide. The dimensions of the basic unit are 5 1/2" x 2 3/4" x 1 3/8", and all other blocks are either multiples or divisions of the unit's width, thickness, or length. The basic unit and double unit comprise 80% of the set of blocks in addition to an assortment of other shapes and sizes.

Large Hollow Blocks are wooden blocks much larger than unit blocks, hollow as opposed to solid, and particularly suited for outdoor use. The dimensions of the large hollow blocks are 12" x 12" x 6" and 12" x 6" x 6". They are

square-, rectangular-, and triangular-shaped. The rectangular and square blocks make up 90% of the set.

Need for the Study

Several studies have investigated the relationship between block play and children's social development, but only in a non-specific manner as part of a larger study (Bender, 1978, Clark, Wyon, & Richards, 1969; Hulson, 1930a; Kinsman & Berk, 1979; Massey, 1970, Parten, 1932; Van Alstyne, 1932). A major limitation of these investigations is the lack of clear, concise definitions for the relatively small number of social behaviors observed. Some of these studies were conducted almost a half century ago and most focused primarily on preschool children. Another weakness exhibited by these investigations is the lack of demographic data reported on the children observed. Many of the studies did not report the race of the subjects. Therefore, although several studies have explored the relationship between block play and the social development of young children, no studies have thoroughly examined block play exclusively in this developmental area.

Hymes (1968) stressed the importance of providing opportunities and experiences to promote positive social growth in the kindergarten child. A better understanding of what social behavior occurs during block play is

necessary to help kindergarten teachers provide appropriate social learning experiences for children. Little current information about the relationships between unit or large hollow block play on social development exists to aid the kindergarten teacher in making the specific decisions needed to guide children's social learning in the block area. Therefore, an in-depth study of the specifically defined social behaviors that occur during the block play of kindergarten children is needed.

There is a recent trend among some educators to change the goals of the kindergarten curriculum from that of educating the "whole child" through a challenging and flexible experiential program to preparing the child for first grade through a structured, task-oriented, pencil and paper "academic" readiness program (Blackwell, 1980). Hymes (1968) expressed concern about this trend toward a rigid, content-oriented approach. He emphasized that good kindergartens should seek to promote "total development" and argued that a "seat-work" approach to learning deprives the child of opportunities for social development: "Kindergartners are social beginners. A good day in school is a day spent in small subgroups, in clusters of two or three or four" (p. 2). Block play encourages this kind of grouping among children.

Furthermore, Hymes emphasized that "kindergarten tools for learning are not the 'standard' tools: chair, paper, pencil, book" (p. 10). Children need to be actively

involved in their learning through a multitude of "hands-on" experiences, according to Piaget (Bringuier, 1980). Blocks are one of the "tools" for learning readily available in most kindergarten classrooms and thus we need to discover more about the power of this "tool" to promote both cognitive and social learning.

To get a more complete understanding of the relationship between block play and social development, the two most commonly found types of blocks in kindergarten classrooms, unit blocks and large hollow blocks, need to be studied. Although unit and large hollow blocks are both predominantly rectangular wooden blocks, they also have many different physical properties. For example, the large hollow blocks are much larger and heavier than the unit blocks. The standard unit block is 5 1/2" x 2 3/4" x 1 3/8" and weighs only a few ounces; the standard large hollow block is 24" x 12" x 6" and weighs several pounds. While a kindergarten child can easily transport and manipulate several unit blocks at a time he or she can probably carry only one large hollow block. Some children require the assistance of another child when transporting or building with large hollow blocks. The large hollow blocks are big enough for children to make structures that they can actually crawl into or climb. Unlike large hollow blocks, the unit block set contains a variety of differently shaped blocks as well as squares, triangles, and rectangles.

These physical differences suggest there will be differences in children's use of these two types of blocks and thus differences in their social behavior as they build and play with either unit or large hollow blocks. There has been very little research on large hollow blocks. Additionally, there have been no studies to date which compared the social behavior of children playing with these two types of blocks and the possible relationships between block play and the social development of the kindergarten child.

A review of the literature on play materials indicates that blocks are among the most popular play material of young children, especially the kindergarten child (Hartley, Frank, & Goldenson, 1952; Kinsman & Berk, 1979; Van Alstyne, 1932). The literature also suggests that boys like blocks more than girls (Beeson & Williams, 1979; Clark et al., 1969; Farrell, 1957) but that when girls are given equal access to the block area the interest level is similar between sexes (Varma, 1980).

Little information exists about the relationships between play with unit or large hollow blocks and the social development of kindergarten children. Moreover, the general and vague definitions of social behavior of the earlier studies suggest a need for more specific in-depth examination of kindergarten children's social behavior during unit and hollow block play. As a result of the vague and general character of the earlier research findings, kindergarten

teachers have limited information concerning the possible social learning situations that may occur when small groups of kindergarten children play with these two types of blocks. In addition, there is a current trend among some kindergarten teachers to sacrifice social activities such as block play, in order to provide time to practice readiness skills. There is a danger in eliminating block play from the kindergarten curriculum without further investigation into the educational and social value of this activity. Finally, kindergarten children's preference for blocks and their availability in most kindergarten classrooms make blocks a potentially valuable learning material and lend support for the need to examine more carefully the unit and large hollow block play of kindergarten children.

Limitations to the Study

Twenty children from one kindergarten classroom at P.K. Yonge Laboratory School were the subjects for this study. P.K. Yonge classes are as representative as possible of Florida's population in terms of race and socioeconomic status (SES). Therefore, the sample, although small, was composed of a mixed-sex, -race, and -SES group of kindergarten children.

As a result of the small sample size, the relationship between social behavior as it occurred during block play and the effects of birth order, race, SES, and the level of

social development was not examined. However, in an effort to control for the above-mentioned variables, this study was designed to compare each child's social behavior occurring during unit block play to the social behavior of that same child occurring during large hollow block play. A thorough description of the classroom setting and the educational practices of the teacher, in addition to the detailed demographic information pertaining to the children, is included in Chapter III to provide information for the interpretation of the results of this investigation.

An observation checklist was used in the collection of data. A checklist has the advantage of providing a more consistent record than other observational techniques and the checklist format reduces the chance of errors during analysis. The use of a checklist, however, may limit the findings because of its brevity and relative inflexibility.

The presence of two observers may have affected the children's behavior. However, observers are very common in this classroom and probably had little effect on the children's behavior.

Finally, the size and composition of the groups playing with the blocks may have had an impact on the behavior of the children. The group selection process was carefully planned in an attempt to control these confounding variables. Total control over these variables was impossible and further research is needed to study the effect of both group

size and composition on the social behaviors of young children playing with blocks.

Summary

This study investigated the social behavior of kindergarten children during play with large hollow blocks and unit blocks. It also compared the differences and similarities in the social behavior and social participation during the unit and large hollow block play of kindergarten boys and girls. This study was designed to add to the existing knowledge of block play and its relationship to social development. The findings from this study provide kindergarten teachers with a better understanding of the social behaviors that are likely to occur when kindergarten boys and girls play with each of these types of blocks. The results of this study furnish teachers with information needed to assist them in making curriculum and instruction decisions in order to provide suitable social learning experiences to meet the needs of individual kindergarten children.

CHAPTER II
REVIEW OF THE RESEARCH

A survey of the literature related to the study of the social behavior of young children during block play revealed three distinct areas of investigation: (1) the materials preference of kindergarten and preschool children, (2) the relationships between the choice of play material, the social behavior and social participation of children, and (3) the sex differences in the materials preference, social behavior, and social participation of the child. The following review will examine studies reported in these three areas focusing on the relationships between block play and the social development of the child.

Young Children's Preference for Blocks

Since the late 1920s, a number of studies have been conducted in order to determine the preferred play materials and activities of young children. These studies are reported below. The reader should note that many of the earlier studies made no reference to the socio-economic status (SES) or race of their subjects. Race, age, sex, and SES will be reported in this review only for those studies that contained this demographic information.

Naturalistic Observational Studies

Large blocks ranked second in popularity among 25 play materials in an observational study of nine preschool children conducted by Bott (1928). She divided the children into three groups (two- to three-year-olds, three- to four-year-olds, and over four), reporting the findings of only three children at each age level. Materials were assigned to five categories: patterned, raw materials, locomotor, mechanical, and unclassified. She found that the category of raw materials, which included blocks, was used for the longest periods of time by the two- to three- and three- to four-year-old groups and for the second longest periods of time by the over four-year-old group. Bott acknowledged that the small number of cases limits generalizability, but the results suggested the importance of the availability of raw materials, including blocks, for preschool children.

Hulson (1930a) gained similar results by studying ten four-year-old preschoolers, six over a period of one school year and four over a four-month period, for an hour during free-play each day. When the 13 materials investigated were "ranked in order according to the number of times chosen, number of minutes used, persistence in use, and social value, it was found that blocks held first rank in all four" (p. 208). Hulson, like Bott (1928), observed only a small number of subjects. However, she used a method of consecutive

observations over a period of a school year, so many observations were made of these relatively few children.

In her study of 271 middle- and low-SES kindergarten, first-, and second-grade children, Farwell (1930) introduced "specific constructive play materials" into the classrooms and recorded the percentage of time children interacted with each material during a 30-minute period for 14 days. She found that boys ranked the Hill Floor blocks (large hollow blocks) "first in importance." The interest in building blocks by girls--especially the Froebelian Gift blocks (like unit blocks)--"decreased from fair interest in kindergarten to practically no interest in second-grade" (p. 531).

Van Alstyne (1932) observed 112 mixed-race and mixed-SES two- to five-year-old children in seven different preschools and kindergartens over a period of four months. Each child was observed for at least 10 hours. Her findings indicated that of the 25 play materials studied, blocks were the most preferred play material of four- and five-year-olds.

Parten (1933) recorded the activities of 23 high-, middle-, and low-SES two-, three-, and four-year-old children for one minute each day during free-play period until at least 60 independent behavior samples were obtained for each child. She noted 110 different activities; 33 were observed only once, 79 less than 10 times, 24 from 20 to 100 times, and 12 more than 100 times. On the basis of "frequency of occurrence," building with blocks was ranked eighth. The

materials ranked fifth through seventh had scores so similar so as not to be statistically significant. Although Parten did not find blocks to be as popular as Van Alstyne (1932) and Hulson (1930a), she did establish them as a much preferred material, rated eighth out of 110.

Hartley, Frank, and Goldenson (1952), found blocks to be the most popular play material of 217 preschool children from "varied cultures and national backgrounds" and ranging in age from two and one-half to five and one-half years. These children were observed in 20 different preschools during free-play as part of a comprehensive study on children's play. Observers kept running records of the activities, context, language, interactions with others, and time of events. Of the 217 children studied over a two-year period, 97 were observed choosing blocks, while 83 chose to paint, and 75 chose clay. Blocks also ranked first in general popularity (the number of children using blocks on each occasion). Blocks attained this number one ranking despite the differing methods and attitudes of the various teachers and the wide variety of physical environments of the 20 preschools involved in this study.

Clark, Wyon, and Richards (1969) observed 40 middle-class English preschool children during their free-play period. The 18 boys and 22 girls, from two different preschools, were observed for approximately 13 hours. An unobtrusive observer recorded one child's behavior for a 10-

second interval then recorded the behavior of another child. The observation periods were spread across the school year and normally lasted about one hour. The findings indicated that of 19 preschool activities, blocks ranked first with boys and ninth with girls. The preference was determined by the amount of time each child spent with a particular material or was involved in a particular activity.

Kinsman and Berk (1979) found that "children preferred the block area and were observed playing there almost twice as often as the housekeeping setting" (p. 70). In a university laboratory school, the 21 boys and 16 girls were aged three and one-half to six and one-half years. The observer focused on the block and housekeeping areas, alternating between the two every five minutes and dictating the following information into a tape recorder every 20 seconds: identity of each child in the setting, group size and composition, type of play, location of child's activity, and child's affective expression. For six weeks the children were observed a total of nine hours a week, four hours in the preschool and five in the kindergarten. Kinsman and Berk found no sex differences in the amount of time boys and girls spent in the block area.

In summary, the naturalistic observational studies appear to indicate that when preschool and kindergarten children are given the opportunity to choose play materials, their first or second choice will be blocks (Clark et al.,

1969; Hartley et al., 1952; Hulson, 1930a; Van Alstyne, 1932), especially large blocks (Bott, 1928; Farwell, 1930). While Bott (1928) and Clark et al. (1969) found boys expressed more interest in blocks than did girls, Kinsman and Berk (1979) found boys and girls spent equal time in the block area. Out of 110 activities observed by Parten (1933) blocks ranked eighth, behind second-ranked housekeeping. Kinsman and Berk (1979), however, found children played in the block area twice as much as in the housekeeping. In analyzing the findings of these studies, there is evidence to support preference of blocks as a play material for young children.

The following section describes a number of studies that did not use naturalistic observational methodology to study the play materials preferences of children. These studies are a composite of various methodologies and designs.

Other Studies Investigating the Play Materials Preferences of Young Children

The following four studies examined young children's preference for materials and found conflicting evidence for the popularity of blocks. Vance and McCall (1934) and Margolin and Leton (1961) found blocks were rated as least preferred by children. Cockrell's (1935) findings indicated blocks were of intermediate rank in young children's choice of materials, while Vlietstra (1978) found blocks to be more popular than pictures.

Vance and McCall (1934) used a method of paired comparison of pictures to investigate children's preferences among 48 materials. They found blocks ranked low with preschool and kindergarten children. The 15 boys and 17 girls studied ranged in age from three and one-half to six and one-half years old. The subjects' families were members of "professional and business classes." The blocks rated low by the children were similar to unit blocks. In addition, the findings indicated girls enjoyed materials which involved "more passive play," while the boys preferred wood working, large blocks, and materials which involved "more strenuous activity."

In a similar study, Margolin and Leton (1961) randomly selected 200 mixed-SES kindergartners, five boys and five girls from 20 classrooms in Los Angeles. The purpose of this study was "to investigate children's interest in block play where the situation requires total class participation" (p. 13). Ten photographs portraying a block activity were paired with a photo portraying another activity and the children were asked, "Which of these would you rather be doing?" (p. 14). Non-block activities were chosen much more often than block activities. Girls exhibited a significant preference for the non-block activities. The authors concluded that the use of blocks in the kindergarten classroom should be questioned; however, they also hypothesized that the low blocks rating may have been attributed to children's dislike

for large group activities (it was common practice at that time in the Los Angeles Public Schools to have 25 to 30 children simultaneously playing with blocks) and not their dislike of blocks per se.

Blocks were of intermediate rank among children's preference in play materials according to Cockrell (1935). Cockrell observed six "professional class" two- and three-year-old children, three males and three females, in a laboratory situation with no adult present. The children were observed through a one-way mirror individually and in pairs with each of the following: (1) combined materials, (2) clay and crayons, (3) pictures and books, (4) blocks, (5) housekeeping materials, and (6) only a table and two chairs in the otherwise bare room. The children could terminate the session themselves. The materials were ranked in terms of interest, or "holding power," which was measured by the length of time the children voluntarily remained in the observation room. Combined materials, clay and crayons, pictures and books all ranked ahead of blocks, housekeeping, and bare room in that order.

Vlietstra (1978) presented 10 male and 10 female four-year-old middle-SES children and 20 college students with boxes containing "incongruous" animal pictures and Bristle Blocks. Both groups spent more time playing with the blocks than looking at the pictures during three 10-minute sessions on different days.

While the naturalistic observational studies are in general agreement as to the preference of young children for block play, the other studies are divided in their findings about children's preference for blocks. These other studies reported the following contradictory findings: (1) blocks are among the least preferred of the preschool and kindergarten materials (Margolin & Leton, 1961; Vance & McCall, 1934); (2) blocks are only of intermediate interest to two- and three-year-old children (Cockrell, 1935); and (3) preschool children would rather play with blocks than look at pictures (Vlietstra, 1978).

In analyzing the findings of both the naturalistic observational studies and the other materials preference investigations, it is important to carefully examine the methodology used in each study. The naturalistic observational studies differed from the other studies in two ways (1) they attempted to preserve the natural setting, and (2) a large number of observations were extended over a period of time. Bott (1928), Clark et al. (1969), Farwell (1930), Hartley et al. (1952), Hulson (1930a), Kinsman and Berk (1979), Parten (1933), and Van Alstyne (1932) all observed children in their free-play period without interfering with their play or altering the environment of the school (with the exception of Farwell [1930] who brought the materials into the various classrooms and Kinsman and Berk [1979] who, as a part of their study, combined the block and housekeeping

areas). In all of the naturalistic observational studies, the children were observed a number of times over an extended time period of at least one month and as much as two years. For example, Hartley et al. (1952) observed 217 two and one-half-to five and one-half-year old children for two years in 20 preschools during free-play. Kinsman and Berk (1979) recorded the play behaviors of 37 preschool and kindergarten children for nine hours a week for six consecutive weeks. Van Alstyne (1932) studied 112 children from five preschools and two kindergartens over a four month period by means of naturalistic observation of each child for at least 10 hours. All three of these studies found blocks to be children's most preferred play material.

The methodology used in the other studies investigating the play materials preference of children differed greatly from the above in that children were (1) asked on one occasion only to make choices about their preference for play materials by choosing pictures of the material they liked best (Margolin & Leton, 1961; Vance & McCall, 1934) as opposed to observers recording what material the children used; (2) observed in an artificial setting (Cockrell, 1935; Vlietstra, 1978), or (3) observed only on a small number of occasions for short periods of time (Vlietstra, 1978).

Vance and McCall (1934) and Margolin and Leton (1961) used a method of paired comparison of pictures depicting preschool activities to determine preference of materials. This

methodology can be questioned on several counts. The use of pictures to determine preference of materials may be too abstract for young children, most of whom were probably still at an early concrete operational or preoperational level. The large number of choices--48 individual items in eight different groupings--presented by Vance and McCall (1934) may be too confusing for some children. It may also be possible that the pictures of the blocks were not as attractive to the children as the pictures of other toys and materials, thus they were responding to the physical or aesthetic attractiveness of the material pictured as opposed to its usefulness in a play situation.

Although the random selection of 200 subjects strengthens the study by Margolin and Leton (1961), it has four major weaknesses. (1) The children were asked to identify their favorite activity on only one occasion. (2) No follow-up was made to see if the children actually used the materials they claimed to prefer. (3) The low rating for the blocks may have been due to the dislike for the large group situation. (4) The method used was to pair a block photograph 10 times with a picture of another activity and ask the child, "Which of these would you rather be doing?" (p. 14). Vance and McCall (1934) reported that they discarded this approach of continually pairing the same material (blocks, in this case) with a different material each time because the children became confused and questioned why

the experimenters were showing a picture of something they had already seen.

At first glance, Vlietstra's (1978) findings would appear to support the findings of the naturalistic observational studies that indicate young children generally prefer blocks to other play materials. However, because this study used Bristle Blocks, which differ greatly in form and function from both unit and large hollow blocks, the use of Vlietstra's findings as support for the preference of blocks by young children may be somewhat tenuous.

The findings of Vlietstra and Cockrell (1935), are weakened by the fact the children were observed alone (for part of Cockrell's study), in a laboratory setting, and not with other children in their own classroom. Cockrell's results might also be questioned not simply because blocks were not ranked higher, but because housekeeping, rated extremely high by most of the naturalistic observational studies, was ranked fifth out of six. The ages of the six children observed in Cockrell's study, two- and three-year-olds, may also have affected their choice of materials.

In examining those studies where some or all of the subjects were kindergarten children the following conclusions can be reached. The naturalistic observational studies indicate that: (1) blocks are the number one choice of kindergartners (Hartley et al., 1952; Van Alstyne, 1932); (2) middle-class kindergarten boys and girls prefer blocks

to the housekeeping area (Kinsman & Berk, 1979); (3) kindergarten boys prefer large hollow blocks over all other material while the interest in blocks by girls decreases from "fair" in kindergarten to "no interest" in second-grade (Farwell, 1930). However, Margolin and Leton (1961), using paired comparison of pictures, reported blocks are among the least preferred play material of kindergarten children. The general agreement of the findings of the naturalistic observational studies, and the overall methodological weaknesses of Margolin and Leton's study pointed out above, provides strong evidence that kindergarten children are quite interested in blocks.

While the studies are divided in their findings concerning block preference in young children, careful examination of the methodology of all of these investigations leads one to believe that the evidence supports the conclusions of Bott (1928), Clark et al. (1969), Farwell (1930), Hartley et al. (1952), Hulson (1930a), Kinsman and Berk (1979), Parten (1933), and Van Alstyne (1932) that blocks are a preferred play material of young children.

If blocks are a preferred play material then what types of blocks are most popular with young children? A number of different kinds of blocks have been available for use in preschool and kindergarten classrooms since the 1920s, and a few early studies investigating the materials preferences of young children differentiated between several types of

blocks when ranking the materials chosen. These studies are reported below.

Young Children's Preference for Unit and Large Hollow Blocks

Only four studies reported results distinguishing between children's preference for a certain type of blocks. Three of these investigations (Bott, 1928; Farwell, 1930; Vance & McCall, 1934) cited large hollow blocks as being the most preferred type of blocks while one study (Hulson, 1930b) found unit blocks to be the most popular with children. All four of these studies are about 50 years old and certainly children's preferences for blocks may have changed in that time. However, recent texts in the early childhood curriculum area (Cohen & Rudolph, 1977; Maxim, 1980; Spodek, 1978) and other literature pertaining to blocks (Bender, 1978; Benish, 1978; Cartwright, 1974; Hirsch, 1974) all state that unit and large hollow blocks are the most common types of blocks found in a preschool or kindergarten classroom. A summary of the studies which investigated young children's preference for blocks is presented in Table 1.

In summary, if blocks are a preferred play material of kindergarten and preschool children, then a thorough investigation into the block play of young children is needed. Since most of the cited studies are more than 20 years old, a need exists to find out more about the value of blocks as play material for children today. There is also a need to

Table 1. Summary of Studies Which Investigated Young Children's Preference for Blocks

Investigators	Date of Study	Subjects					
		n	m	f	age	race	SES
Bott	1928	9	-	-	2 to 6	--	--
Hulson	1930	10	-	-	4	--	--
Farwell	1930	271	125	246	5 to 7	--	--
Van Alstyne	1932	112	54	58	2 to 5	black, white, "2nd gen. imm."	low, middle, high
Parten	1933	34	19	15	2 to 4	--	low, middle, high
Vance & McCall	1934	32	15	17	$3\frac{1}{2}$ to $6\frac{1}{2}$	--	"professional & business classes"
Cockrell	1935	6	3	3	2 to 3	--	"professional class"
Hartley, Frank, & Goldenson	1952	217	-	-	$2\frac{1}{2}$ to $5\frac{1}{2}$	"varied cultures & material backgrounds"	--
Margolin & Leton	1961	200	100	100	$4\frac{1}{2}$ to $5\frac{1}{2}$	--	low, middle, high

Table 1. Extended

Duration of Study	Methodology	Findings
2 years	Naturalistic Observation	Category which included blocks ranked first by 2-4 year olds and second by most over 4 years old.
4-10 months	Naturalistic Observation	Blocks ranked first out of 13 materials for "times chosen," "number of minutes used," and "persistence in use."
2 weeks	Naturalistic Observation	Large hollow blocks "first in importance for boys"--kindergarten girls had fair interest in blocks.
4 months	Naturalistic Observation	Blocks were the most preferred of 25 play materials.
4 months	Naturalistic Observation	Blocks rated eighth out of 110 materials on the basis of "frequency of occurrence."
1 occasion	Paired comparison of pictures	Blocks were rated as "low" preference among 48 play materials.
2 occasions	Subjects observed alone and in pairs in laboratory situation.	Blocks ranked fourth out of six materials for time "holding power"--(the length of time the children remained in the observation room).
2 years	Naturalistic Observation	Blocks ranked first in "general popularity" (the number of children using blocks on each occasion).
1 occasion	Paired comparison of pictures	Non-block activities chosen much more often than block activities.

Table 1. Continued

Investigators	Date of Study	Subjects					
		n	m	f	age	race	SES
Clark, Wyon, & Richards	1969	40	22	18	3 to 5	--	Middle (British)
Vlietstra	1978	20	10	10	4	--	Middle
Kinsman & Berk	1979	37	20	17	$3\frac{1}{2}$ to $6\frac{1}{2}$	white	Middle

Table 1. Extended

Duration of Study	Methodology	Findings
10 months	Naturalistic Observation	Block play was the first choice of boys and ninth choice of girls out of a possible 19 activities.
3-10 minute sessions	Observation in laboratory situation	The children spent more time with blocks than with pictures.
6 weeks	Naturalistic Observation	Children spent almost twice as much time in the block area as they did in the housekeeping area.

investigate the differences in play behavior when young children use large hollow blocks as opposed to unit blocks, because of the availability and popularity of these two types of blocks in preschools and kindergartens today. A difference of opinion exists on the effect of sex on the interest of children in block play. Bott (1928) and Clark et al. (1969) found boys to be more interested in blocks than girls were, while Kinsman and Berk (1979) found no sex differences in the amount of time boys and girls played with blocks. Therefore, further study of the differences and similarities between the block play of boys and girls is indicated.

What is the significance of understanding the kindergarten child's preference for blocks? How will this help one to become a better kindergarten teacher? Van Alstyne (1932) aptly answered both of these questions. "Any interpretation of the results of this study must be based on the assumption that a child's spontaneous interests are a guide to his actual needs" (p. 84). Children's high interest level in blocks plus the need to update our knowledge and increase our understanding of how kindergarten boys and girls play with unit and large hollow blocks, warrants the further investigation into the behavior of children as they play with this popular material. Information from this investigation could aid teachers in making curriculum decisions pertaining to what type of block play has the potential to best meet the specific needs of different children.

Play and Social Development

The importance of play to the development of the young child has been emphasized by child development experts and early childhood educators alike (Piaget, 1962; Smilansky, 1968; Spodek, 1974; Sponseller, 1974; Vygotsky, 1978). Play is the medium in which children learn best (Spodek, 1974). According to Vygotsky, "The child moves forward [develops] essentially through play activity" (p. 103).

Play contributes to learning in all the developmental areas including social development (Sponseller, 1974). Isaacs (1972), Piaget (1962), and Smilansky (1968) stated that socio-dramatic play, through recognition of others and cooperation and participation in mutual activities with other children, aids in the transformation of an ego-centric child into a social individual. Forman and Hill (1980) provided a good example of this social learning process through play:

> Dramatic play episodes allow children the freedom to expand their behaviors beyond an egocentric perspective. When pretending to be a rescue medic, a child develops ideas about another person's activities that are different from his own. (p. 105)

Furthermore as Piaget (1932) pointed out, when a child plays with another child he/she may come to realize that the other child does not necessarily share his/her own point of view. When the child makes this discovery then he/she begins to question the other child's ideas and thus redefines

and clarifies his/her own thoughts. At this point social learning has taken place. Thus, Piaget believed that "one of the most important functions of social play may be the diminution of ego-centrism and the development of role-taking" (p. 484).

What about the relationship between social development and play involving preschool and kindergarten materials? Forman and Hill (1980) stated that "the child uses the same intelligence to solve problems of a social nature that she uses to solve other problems" (p. 68). In other words, a child's relationship to the physical world may help that child make "more accurate judgments about the social world" (p. 68). For example, if a child realizes that his/her wooden cylinder can roll down a ramp in the same manner as the wooden cylinder that another child is using, then he/she will not feel the need to take that other child's cylinder.

Cockrell (1935) found an interesting relationship between social interaction and the presence of play material. She reported that when the two- and three-year-old children were observed in pairs, they spent only 2% of their time "in attention to self" in the room containing "combined materials" (clay, crayons, books, pictures, blocks, and housekeeping materials) but spent 31% of the time in "self-play" when observed on another occasion in the same room empty of all equipment except a table and two chairs. Cockrell felt

these findings indicated that "depriving these children of play materials forced them much more to attend to themsevles than to play with their companion" (p. 463).

Play has been established by Issacs (1972), Piaget (1962), Smilansky (1968), and others as crucial to the social development of young children. Forman and Hill (1980) suggested there is a relationship between social learning and the knowledge a child gains about the physical world through constructive play. A relationship between the amount of social interaction and the presence of play materials was observed in Cockrell's (1935) study of two- and three-year-old children.

The theories and research outlined above would appear to justify further investigation into the relaitonship between specific play materials and social play. The following statement by Van Alstyne (1932) provides additional support for studying this relationship.

> Since play has these values in developing and socializing the child, it is of considerable importance to know which materials tend to provice the best setting for social participation. (p. 2)

Is there a relationship between the social participation of a child and the activity in which that child is engaged? The findings from the following studies will help to answer this and other questions concerning the relationship between social behavior and the child's choice of play material.

Relationships Between the Use of Blocks and Other Selected Materials and the Social Participation of Young Children

The following investigations examined the relationship between materials and social play. These studies sought to find out what kind of social play occurred while young children were playing with various selected materials, one of these materials being blocks. Many of these studies used Parten's (1932) scale of social participation to determine a child's level of social play. Parten's levels of social participation are: (1) unoccupied behavior, (2) solitary play, (3) onlooker behavior, (4) parallel play, (5) associative play, and (6) cooperative play in that hierarchical order.

Parten (1933) utilized her six categories of social participation in a study of 34 preschool children observed daily at free-play until 60 one-minute behavior samples were recorded. The social situations which accompanied play with each type of material were analyzed for their social participation value. In order to ensure an unbiased sample, the last one or two instances of play with each material were chosen from each child's record until 50 instances were recorded for every material. The housekeeping area and dolls ranked highest in cooperative play. Block play occurred at almost equal frequencies at the solitary, parallel, associative and cooperative levels. Clay was found to elicit

primarily parallel play, a moderate amount of associative, and no cooperative or solitary play. Parten also assigned social participation scores for the 10 favorite materials by weighting each level of social play in the following manner: unoccupied behavior, -3; solitary play, -2; onlooker behavior, -1; parallel play, 1; associative play, 2; cooperative play, 3. The results of the social participation score for each material were the house and doll corner ranked first with a score of 103, and blocks and clay tied for third with scores of 51 each.

Brown (1942) reported 83% of the girls and 70% of the boys played alone with blocks. She recorded all the behaviors and conversations of 50 kindergartners for 10 weeks during self-chosen activity periods. Brown did not use Parten's (1932) social participation levels to classify the children's level of social play, so we cannot be sure how much of the self-play she observed was solitary and how much was parallel nor can we assume that the time boys and girls were not playing alone they were engaged in group play.

Parallel play was most often recorded by Clark et al. (1969) during the table activities (finger painting, cutting, glueing, sewing, coloring, etc.) of three- and four-year-old middle-income British preschoolers. Cooperative play, "children participating together," however, was most commonly observed in the block area.

In accordance with Parten's (1932, 1933) findings, all levels of social play occurred in almost equal frequency during an investigation of the block play of five-year-olds conducted by Massey (1970). Each of the 32 kindergarten children, 16 middle-class white males and 16 females, participated in three separate 20-minute sessions in a laboratory observation room: (1) alone, (2) one boy and one girl, and (3) two boys and two girls. The children were asked to build a structure and were left alone and videotaped for 15 minutes. They were then presented with accessory items and left to build for five more minutes. Unit blocks in quantities of 90, 180 and 280 were present in the room for one, two, and four children, respectively. Photographs of the structures were taken after the session ended and the frequency of behaviors was recorded by a trained observer from the videotaped sessions.

Bender (1978), while investigating the large block play of six four-year-olds for a period of eight months, also observed parallel, cooperative, and solitary levels of play when 70 large hollow blocks were used. However, the children engaged in only solitary and parallel play when the number of blocks was reduced to 20.

"Intimate social arrangements of small clusters" and solitary play were observed by Kinsman and Berk (1979) during the housekeeping and block activity time of 37 middle-class white preschool and kindergarten children aged three

and one-half to six years. They did not report on the percentage of parallel play but stated that the children spent 37% of their time in solitary play while involved in these activity areas. They also observed more solitary play in the housekeeping area and more group play in blocks which is contrary to Parten's (1933) findings.

In a study of 15 male and 13 female preschool children ranging in age from three and one-half to five and one-half years, Vandenberg (1981) also found that the play environment influenced the type of social play. The children were allowed access to two different environments: (1) the large muscle room which contained a jungle gym, two slides, tumbling mats, and large blocks and (2) the fine motor room which contained tables with pencils, paints, crayons, scissors, and paste. Each child was observed for one 30-minute period each day. The child's play was scored in 10-second units for (1) types of play, (2) environment in which child was playing, (3) number of children playing with target child, and (4) whether child left or joined the play activity. Children were more likely to be involved in solitary or parallel play in the fine motor room and associative play in the large muscle room. No cooperative play was observed. Vandenberg attributed the lack of cooperative play to the "power of these environments to pull for physical exercise (large and small motor development) at the expense of social interaction" (p. 174). However, Bender (1978), Clark et al.

(1969), Kinsman and Berk (1979), Massey (1970), and Parten (1933) all observed cooperative play while children were playing with blocks. Large hollow blocks were present in the large muscle room in Vandenberg's (1981) study. An alternative explanation for the lack of cooperative play observed by Vandenberg is that it may have been a result of observer error. Johnson and Ershler (1981) and Rubin, Watson, and Jambor (1978) were forced to collapse Parten's associative and cooperative categories because of low inter-observer reliability in differentiating between these categories. Furthermore, Clark and others' (1969) and Parten's (1933) findings would support the lack of cooperative play in the small muscle room reported by Vandenberg (1981).

In analyzing the findings of these studies there appears to be agreement on two major issues: (1) The type of play material has some relationship to the child's level of social participation. (2) There is the potential for solitary, parallel, and cooperative play to occur when young children use blocks in a preschool or kindergarten setting.

Clark et al. (1969), Parten (1933), and Vandenberg (1981) all found that children were most likely to be involved in either parallel or solitary play when using table materials like clay, glue, crayons, scissors, and paints, whereas cooperative play was commonly observed during block play by Clark et al. (1969) and Kinsman and Berk (1979). In addition, Bender (1978) observed mostly cooperative social

play when an adequate amount of large hollow blocks was present. Although Vandenberg (1981) observed no cooperative play, he did report that the play in the large muscle room was predominantly on the associative level as opposed to the predominance of solitary and parallel play observed in the small muscle room.

Bender (1978), Massey (1970), and Parten (1933) all observed solitary, parallel, and cooperative play in the block area. Kinsman and Berk (1979) reported that play in the block center consisted of "intimate social arrangements of small clusters and pairs" and about 35% in solitary play. Brown (1942), however, found boys spent 70% and girls 82% of their time in solitary play while using blocks.

Brown's (1942) findings, however, lend support to those of Green (1933), Parten (1933), Kinsman and Berk (1979), Bender (1978), Hulson (1930a), Massey (1970), and Van Alstyne (1932). That is, both solitary and group play were observed when children participated in block play. The relevance of this finding is best expressed by Kinsman and Berk (1979) who emphasized that the block area has the flexibility to meet "a variety of children's needs from retreat, withdrawal, and absorption in private activity to active group participation and cooperative efforts with other children" (p. 71). Results reported in studies by Moore, Evertson, and Brophy (1974), Roper and Hinde (1978), and Rubin, Maioni, and Hornung (1976) indicated that because a child is playing alone

does not mean the child lacks social skills. It could mean the child has the confidence to do so and thus needs the opportunity to be able to engage in solitary play.

All three of these levels of social play--social, parallel, and cooperative--are important for the social development of the young child. However, further investigation appears to be needed to determine the relationship between the use of blocks and the child's level of social participation.

In summary, Issacs (1972), Piaget (1932, 1962), and Smilansky (1968) have emphasized the importance of play to the social development of the young child. Numerous studies have established blocks as one of the most preferred play materials of young children (Bott, 1928; Clark et al., 1969; Farwell, 1930; Hulson, 1930a; Kinsman & Berk, 1979; Parten, 1933; Van Alstyne, 1932). Since blocks are of great interest to children and play is instrumental in providing children with the opportunity to practice and develop social skills, it seems logical that an in-depth study of social behavior occurring during block play needs to be initiated.

The following section will review the research concerning the relationships between children's social behavior and the materials used by them.

Relationships Between the Use of Blocks and Other Selected Materials and the Social Behavior of Young Children

Block play was determined to have the highest "social value" of 16 activities observed by Hulson (1930a) in her naturalistic observational investigation into the play behaviors of 10 four-year old preschool children during free-play. The "social value" of a material was determined by the number of children playing with a child using a given material. Over twice as many children (517 as compared to 210) were observed playing with the target child during block activities than during play in the second-ranked house corner. The remaining scores ranged from 173 children involved in sand play to three children observed writing on the blackboard. Although this study indicated that blocks may promote social interaction between preschoolers, it did not provide any information as to the quality of this social interaction. Since Hulson did not define the terms "playing with," it is impossible to know whether these children were simply playing alongside the target child in a parallel fashion or the children were actually engaged in some form of group play. Van Alystne (1932) addressed the question of the "social value" of materials in a more qualitative fashion.

The social value of materials was studied by Van Alstyne (1932) by observing the "social reactions" of 112 three-, four-, and five-year-old children playing with one of 25 dif-

different materials. Observations were made of 15-second samplings of play behaviors for a period of four months, totaling approximately 10 hours of observation for each child. The "social value" of each material was rated in terms of "amount of talking," "social grouping" (how many children present), "interfering," and "watching." Contrary to Green (1933), who noted a high percentage of quarrels in the free-play of 40 preschool children using various materials, Van Alstyne (1932) reported "comparatively little interfering" when compared to "cooperation" or "social grouping." The greatest percentage of cooperation for five-year-olds was recorded when they were playing with large hollow blocks.

Studying group play and quarreling during 40 30-second observations of 40 nursery school children, Green (1933) reached a somewhat different conclusion. She found that "dramatic play" (playing house, playing train and playing barber shop) was the most "social," while sand was the most "quarrelsome." "Construction work," which included sawing and using large building blocks, ranked sixth on the scale of sociability--defined as percentage of time playing with companions --and second in the percentage of time involving quarrels. However, several possible weaknesses in this study suggest that the findings should be interpreted with some degree of caution. First, many of the differences between the ratings of the materials are slight and may be a result of observation error or random error. For example, although the

block category ranked sixth in the pro-social grouping at 61.5%, the second-rated activity was only 64.5%, a statistically significant difference between the two may not exist. Furthermore, while blocks were rated as the second most quarrelsome activity at 20.2%, housekeeping was rated third at 20%, a difference of .2%, which may have been a result of observational error. Second, Green's definition of "sociability" (percentage of time playing with companions), like Hulson's (1930a), does not provide any information concerning the specific social behavior that occurred while children played with various materials. Third, the definition and interpretation of the "quarreling" category is subject to dispute. Quarreling is defined as "percent of time involved in quarrels," a vague and somewhat circular definition. It is impossible to interpret Green's results without knowing what constitutes a "quarrel."

Is quarreling necessarily an anti-social behavior? Can children learn certain social skills from some "quarrels?" Did the children resolve these "quarrels" themselves or did a teacher have to step in? Piaget (1932) stated that some degree of conflict is necessary to promote social learning and thus aid in the child's developmental progress in becoming a more social being. Through many naturalistic observations the researcher has found that "disagreements" are common in block play but "physical aggression" and "fights" are rare, and that the children usually solve their "disagreements"

in a mutually acceptable manner. If this is the case, then some "quarrels" may serve a positive function in the social development of the young child. Since Green (1933) never defined "quarrels," we have no way of knowing what kind of behavior she observed, thus making any interpretation difficult.

In a controlled laboratory study of 17 boys and 11 girls ages two and three, "sociability" and "cooperation" were found to occur more frequently while playing with clay than while playing with blocks (Updegraff & Herbst, 1933). The children were paired eight times with one other child and observed for five minutes playing in a room where only one play material was available, either clay or blocks. "Cooperativeness" was defined as "that quality in an individual which makes him willing to carry out with others without submerging his own individuality" (p. 385). "Sociability" was defined as "that quality in an individual which makes him display an interest in the activity of others, a desire to seek companionship, and to make contacts with them" (p. 383). The definitions of "sociability" and "cooperation" again, like those of Green (1933), Hulson (1930a), and Van Alstyne (1932), are vague and thus make it difficult to determine exactly what types of social behavior occurred during play with blocks and other materials.

In a series of studies, Patterson (1976) investigated the role of play materials in the social interaction of a

mixed-sex, -SES, and -race group of 25 four- and five-year-old preschool children. For 16 consecutive school days she made observations during free-play time at each of the four play areas: art, games, blocks, and dramatic play. The first two observational studies confirmed that "assertive-disruptive" interactions occurred most frequently in the block area and least frequently in the art center. "Assertive-disruptive" was defined as "those behaviors which interfere with the other children's activities or which disrupt the routine of the classroom" (p. 2). Patterson went on to further define "assertive-disruptive" as "not synonymous with aggressive" although this category included some of the same behaviors. The behaviors listed were hitting, pushing, throwing toys, taking toys, negative commands, name calling, and "others." The "positive-constructive" category was defined as including all behaviors other than those in the "assertive-disruptive" category.

Patterson points out that "there are differences in the physical materials in blocks and in art that would seem to support different kinds of interactions. The child must "restrain his body movement somewhat in order to use materials appropriately in art . . . [while] the activities in blocks allow more vigorous physical activity, here the normal course of play may lead to more assertive interactions" (p. 5).

These "assertive interactions" may have been misinterpreted by her as "disruptive" when they were actually a form of "rough and tumble play," as observed by Blurton Jones (1967, 1972b). Examples of "assertive" behavior in the block corner involved knocking over blocks and pushing trucks into another child which could have been a low-key form of what Blurton Jones termed "rough and tumble play," a highly pro-social behavior. In summary, Patterson's findings of the high incidences of "assertive-disruptive" interactions in the block area may be questioned on two counts: (1) This category is broad, vague, and generally unclear. (2) Some incidents of "assertive-disruptive" behavior may have been pro-social.

Kinsman and Berk (1979), in their naturalistic observational study of 37 middle-SES, white preschool and kindergarten children, reported a "very low" occurrence of "negative affect" in the housekeeping and block area. "Negative affect" is not defined, making interpretation of these results difficult.

To summarize, Hulson (1930a) and Van Alstyne (1932) agreed that blocks rank high in "social value" using the number of individuals playing with blocks with the target child as the means of determination. Using a different criterion (percent of time with companion), Green's (1933) findings indicated blocks ranked sixth among 11 preschool activities, but only three percentage points behind the second-rated

activity in her "cooperative" or "friendship" category. Updegraff and Herbst (1933) found blocks to be lower in both "sociability" and "cooperation" than clay in a study of two- and three-year-olds in a controlled laboratory setting. Patterson (1976) observed more "assertive-disruptive" behavior in the block area than in either art, games, or dramatic play areas in her two observational studies of four- and five-year-olds. "Quarrels" occurred frequently in the block area according to Green (1933) but were seldom observed by Kinsman and Berk (1979).

In general, the evidence is conflicting in regard to the relationship between block play and social behavior of young children. However, the inability to make any educated hypothesis in regard to this question is not so much a result of the contrary findings of these studies but is instead becauseof the lack of clear, concise, and understandable definitions of the social behavior observed.

Sex Differences in the Materials Preference, Social Participation, and Social Behavior of Young Children

This section will review those studies which have investigated the relationship between sex and materials preference, social participation, and social behavior of preschool and kindergarten children, especially those studies concerned with block play.

Sex Differences in the Materials Preference of Young Children

The majority of both experimentally-manipulated and naturalistic observational studies indicated that preschool and kindergarten boys were more likely to play with blocks than girls (Beeson & Williams, 1979; Bott, 1928; Clark et al., 1969; Farrell, 1957; Farwell, 1930; Margolin & Leton, 1961; Patterson, 1976; Rubin, 1977; Van Alstyne, 1932; Varma, 1980). However, Brenner (1976), Kinsman and Berk (1979), and Vandenberg (1981) found no sex differences existed in the preference for blocks of three- to six-year-old children. Brenner's (1976) sample was composed of 18 white middle class three and four years old, nine boys and nine girls. Kinsman and Berk (1979) observed 37 white middle-class three- to six-year-old children, 21 boys and 16 girls, in a university laboratory school while Vandenberg (1981) studied 15 male and 13 female, white middle-class three and one-half- to five and one-half-year-old children in an urban preschool. The small sample of white middle-class children investigated by Brenner (1976), Kinsman and Berk (1979), and Vandenberg (1981) as compared to larger samples (from 40 to 271) of Beeson and Williams (1979), Clark et al. (1969), Farrell (1957), Farwell (1930), Margolin and Leton (1961), Rubin (1977), and Van Alstyne (1932) would seem to indicate a good deal more support for the

findings that suggest there is a sex difference in young children's preference for blocks.

Although it would appear that blocks are probably not as popular with preschool and kindergarten girls as with boys, it is important to note that blocks did rank on an intermediate-to-high level with girls in most of the materials preference studies. More importantly, however, is the fact that, given the proper environment, girls choose to play with and use blocks as much as do boys (Brenner, 1976; Kinsman & Berk, 1979; Vandenberg, 1981). Varma's (1980) findings reiterated this point.

In a two-part study of eight male and eight female four-year-old preschool children, Varma (1980) first observed the behavior of each child for six five-minute periods on 12 occasions. She found that boys were more likely to engage in block play than girls. She then arranged a new block area identical to the old block area but separated it by a three-foot divider. This new area was designed for the purpose of offering girls direct access to the blocks and to encourage block play among girls. Two observers then made six five-minute observations of each child on eight occasions. The results of the intervention were as follows: (1) an increase in time spent by all girls in block play, (2) three girls who had not used blocks during the first set of observations initiated block play, and (3) five out of the eight boys increased the time spent with blocks when the number of blocks increased with the addition of the identical new block area.

Perhaps the most critical finding was the initiation of block play by three girls who had not previously been observed using blocks. Both Varma (1980) and Patterson (1976) believed the reason girls spent so little time in the block area was a result of boys or the teacher designating the block area as the boys' "territory," and not because they were not interested in blocks. Varma (1980) controlled for this variable of male "dominance" over the blocks by adding another area. This not only encouraged three previously observed female non-users to play in the block corner but also increased the amount of time spent by all the girls and five of the boys playing with blocks. Therefore, although a majority of the studies reported that blocks were used more often by boys than girls, the results of Brenner (1976), Kinsman and Berk (1979), Vandenberg (1981), and Varma (1980) indicated at least the potential for a high degree of interest in blocks by girls.

The next group of studies explored the effect of sex on the social participation of children during free-play. These studies examined social participation using Parten's (1932) levels of social participation.

Sex Differences in the Social Participation of Young Children

Moore, Evertson, and Brophy (1974) found kindergarten boys and girls showed "similar patterns" of solitary play in a naturalistic observational study of 116 white

middle-class children attending six private kindergartens. The teachers of these six classes were trained to observe their children during outdoor and indoor free-play sessions. The number of observations ranged from 7 to 21 with an average length of 35 minutes in a range of 15 to 60 minutes. The teachers recorded any solitary play observed for any child and coded it in one of eight categories. Spot checks on the reliability of the observers (teachers) showed 100% reliability. The only difference found was that girls exhibited more educationally-oriented solitary play. Moore et al. (1974) found no interaction between effects of sex and birth order on solitary play as hypothesized.

Although the sample size appeared adequate, the number of observations sufficient, and the "spot check" reliability high, the methodology of this study may be questioned on several levels. There was no standardization of the length of the observation period or of the number of observations made, thus it is possible some classes could have had many more observations than others. Additionally, the study made no mention of how often each child was observed; it is conceivable that some children were observed many times while others were never observed or observed only a few times. Most notably, it seems questionable to have the teacher as observer. It is difficult enough to be "in charge" of a large group of kindergarten children without the additional responsibility of being a researcher. Their role as

teachers would seemingly take precedence over another's research.

Roper and Hinde (1978) investigated the social participation of three- to five-year-old British preschool children in a naturalistic observational study. The 67 subjects, 37 males and 30 females, were from families whose SES ranged from upper-middle (professional) to lower-middle SES (partly skilled) with the majority from middle SES (skilled or managerial categories). Roper and Hinde found girls were more likely to engage in parallel play than group play while boys were "more involved with other children" when they were playing near them. Boys also were observed more often than girls participating in solitary play. They warned against "deriving a composite index of social participation from the categories of self, parallel and group [on the] assumption that these items lie equidistant along a linear dimension . . . [because] to be playing alone does not necessarily mean the child is lacking in social ability" (p. 577).

Roper and Hinde used what they termed "multiple-scan sampling" to collect the data on these children. The procedure they followed was to observe each child for five seconds, record the data on a checklist, and then observe another child for five seconds. In this way, each child was observed every five minutes, or 11 times each morning. This observational technique was used to increase the probability of obtaining independent samples of behavior. If

observations are taken with short-time intervals in between then what the subject is doing at the time of observation will be affected by what he was doing on the previous observation. Multiple-scan sampling was used to reduce this difficulty and thus increase the chances for independent samples. However, a weakness of this methodology is the short intervals of time (five seconds) that children are observed to determine their level of social participation. Johnson, Ershler, and Bell (1980) defined a cognitive/social play "episode" as "a unit of observation of at least 15-second duration with only one type of cognitive/social play occurring" (p. 272). Although Roper and Hinde (1978) were recording only social play (social participation), five seconds would appear to be too little time to determine a child's level of social participation.

Vandenberg (1981) found no sex differences in the levels of social participation of 15 male and 13 female three- to five-year-old children using the "large muscle" room and the "fine motor" room in preschool. Both girls and boys were likely to participate in solitary and parallel play in the "fine motor" room and to participate in associative play (defined by Parten, 1932) in the "large muscle" room.

Roper and Hinde (1978) reported that three- to five-year-old girls were more likely to be involved in parallel than group play while the opposite was found to be true for boys of the same age. Moore et al. (1974) and Vandenberg

(1981) found no sex difference in the level of social participation of preschoolers and kindergartners. Moore et al. (1974) and Roper and Hinde (1978) pointed out there may be differences in the manner in which young children play at each of these levels. Moreover, Roper and Hinde (1978) emphasized the importance of solitary as well as parallel and group play for the development of the child. They further warned against calculating a composite index of social participation from the categories of solitary, parallel, and group play because solitary play does not necessarily indicate immature play. Play at each of these levels of social participation is important to the development of the child.

The following section will review those studies concerned with the sex differences in children's social behavior during play.

Sex Differences in the Social Behavior of Young Children

Massey (1970) found no significant sex differences in the "social interaction" of 32 white middle-class, five-year-old kindergarten children, 16 male and 16 female. She defined "social interaction" as the total number of verbal contacts to another child, cooperative block building, verbal directions carried out, and physical directions carried out. She observed each child in three separate 20-minute sessions (individually, a boy and a girl, and two boys and two girls) in a specially designed observation room filled

with blocks and equipped with a hidden videotape camera. There were three major weaknesses of this study that should be considered in interpreting Massey's findings: (1) The definition of social interaction provides us with information about the quantity of verbal contacts and not the quality of them, and (2) she does not define her other categories of social interaction (cooperative block building, verbal and physical directions carried out), and (3) the possibility exists that the "social interaction" of Massey's (1970) subjects was influenced by the laboratory setting.

In a series of three studies Patterson (1976) investigated the effect of play materials on the social behavior of four- and five-year-old preschool children. The subjects, 14 boys and 11 girls, were from a variety of socioeconomic and racial backgrounds. Patterson found in the first observational study that boys exhibited more "assertive-disruptive" behavior than did girls when observed during the free-play hour in the art, games, blocks and dramatic play areas. She also found that boys' "assertive-disruptive" behaviors occurred most frequently in the block area and least frequently in the art area. The second observational study confirmed the earlier findings. The same methodology was used; each child was observed for 30 seconds over a period of 16 consecutive school days during free-play hour.

In Patterson's (1976) third study the children were observed in same-sex groups of three, once with an art activity

and once with blocks, for an observation period of 10 minutes with each type of activity. The boys were found to exhibit more "assertive-disruptive" behavior than the girls, a finding consistent with the other studies. However, in the laboratory setting, the boys' "assertive-disruptive" behavior occurred more frequently during the art activity and less frequently with blocks which was contrary to the findings of Patterson's two other naturalistic observational studies. The frequency of the "assertive-disruptive" behavior of the girls was similar to that observed in the classroom setting.

Patterson's (1976) findings indicated a sex difference in the social behavior of boys and girls involved in art activities and block play in both naturalistic and laboratory situations. Her definition of "assertive-disruptive" behavior, "those behaviors which interfere with the other children's activities or which disrupt the routine of the classroom" (Patterson, 1976, p. 2), make it difficult to determine whether this category represents prosocial or antisocial behavior or some of both. For example, a child could "interfere" with another child's activity in a playful and very prosocial manner. Therefore, although Patterson's findings suggested a difference in the social behavior of boys and girls during art activities and block play, the specific social behaviors that accounted for this difference were not reported, thus limiting interpretation and implications of these findings.

Eisenberg-Berg and Hand (1979) found no overall sex differences in the "sharing" and "helping/comforting" behavior of predominantly middle-class four- and five-year-old preschoolers. The subjects, 18 boys and 17 girls, were all white with the exception of two Chicanos and one American Indian and attended a university preschool. Each child was randomly observed for a minimum of 70 two-minute periods over 6-11 weeks. The observers recorded how often the children shared, helped, or comforted during each two minute period. "Comforting" was later combined with "helping" as a result of infrequent occurrence of this behavior.

In a meta-analysis of 32 observational studies on peer-directed aggression, Maccoby and Jacklin (1980) found highly significant sex differences in children six years of age and younger. The Z values suggested higher male aggression in 24 of the 32 studies, no difference in 3, and no study found higher rates of female aggression.

Tieger (1980) refuted the findings of Maccoby and Jacklin (1980) by using a meta-analysis technique suggested by Cooper (1979). Using Cooper's procedure Tieger (1980) chose to examine all studies which observed aggressive behaviors in children of six years or younger. Maccoby and Jacklin (1980) included two studies in which the subjects' ages ranged from four to seven and five to eight. Tieger (1980) also looked at studies which "measured aggression defined as behaviors involving attacks, fighting, interpersonal disputes,

or actions implying intent to harm" (p. 952). Most of the Maccoby and Jacklin (1980) studies were included because of the broad nature of their definition. Two other studies were excluded because one contained no relevant measure of aggression (Smith & Connolly, 1972) while the other did not report a main effect of sex differences (Langdois, Gottfried, & Seay, 1973). Tieger's (1980) meta-analysis revealed a weighted $Z=1.148$ with a probability of $p=.125$ thus suggesting that sex differences in the aggressive behavior of children under six may not exist.

Maccoby and Jacklin (1980) claimed Tieger (1980) underestimated the significance of the combined set of results by misuse of the Stouffer weighted procedure (cited in Cooper, 1979). They asserted that Tieger converted the two-tailed values, published by Maccoby and Jacklin (1980), to one-tailed-values only once when the procedure calls for the one-tailed-values for each case.

Another problem with the Maccoby and Jacklin (1980) meta-analysis was that in all but 2 of the 24 studies which showed boys under six to be more aggressive, aggression was categorized in a non-specific manner (i.e., "aggression," "agonistic intentions," and "direct physical aggression"). "Rough and tumble" play, found by Blurton Jones (1972b) to be a very physical but highly prosocial behavior, easily could have been coded as aggression under these general categories.

The findings from these studies suggested that sex differences may not exist in the prosocial behavior of children under six (Massey, 1970; Eisenberg-Berg, 1979) but there remains a great debate as to the relationship of sex to the aggressive behavior of children under six years of age (Maccoby & Jacklin, 1980; Tieger, 1980).

In summary, the research suggested that boys prefer blocks (Beeson & Williams, 1979; Bott, 1928; Clark et al., 1969; Farrell, 1957; Farwell, 1930; Margolin & Leton, 1961; Patterson, 1976; Rubin, 1977; Van Alstyne, 1932) but girls are highly interested in blocks if provided the opportunity to use them (Brenner, 1976; Kinsman & Berk, 1979; Vandenberg, 1981; Varma, 1980). Moore et al. (1974) and Vandenberg (1981) found no sex differences in the social participation of young children while Roper and Hinde (1978) did. Contrary evidence also exists regarding sex differences in their social behavior. Massey (1970) and Eisenberg-Berg (1979) found no sex differences in prosocial behavior of four- and five-year-old children. However, results of two separate meta-analyses of observational studies of aggressive behavior of children under six conflicted. One study reported that sex differences were highly significant (Maccoby & Jacklin, 1980), while the other found no sex differences (Tieger, 1980). Patterson (1976) found sex differences in "assertive-disruptive" behavior with blocks.

Summary

The literature suggests that blocks are a highly preferred play material of preschool and kindergarten children. Blocks are more popular with boys but girls too are very interested in block play, especially when given equal access to the block area. In addition, most American kindergarten and preschool classrooms are equipped with either unit blocks, large hollow blocks, or both.

Isaacs (1972), Piaget (1962), and Smilansky (1968) emphasized the value of play for the social development of the child. Hymes (1968) stressed the goal of kindergarten education is to educate the "whole child" through experiences which allow the child to work and play in small groups. The use of blocks in a kindergarten classroom provides both the opportunity for play and small group interaction.

The research appears to indicate that there may be a relationship between certain materials and the level of social participation and the social behavior of children. However, the findings from these studies are of limited value to kindergarten teachers in planning appropriate social learning experiences for individual children primarily because of the vague definitions of social behaviors.

There exists a need to further examine the relationship between social behavior and play materials. An investigation into the block play of kindergarten children is both

logical and necessary. It is logical because children like blocks and they are available in most kindergartens. It is necessary because, although the area of social development is an integral part of the kindergarten curriculum, it has been overshadowed by the recent "first-grade prep" movement. Thus it is more important for the teacher to know more about the relationships between unit and large hollow block play and the social development of kindergarten children. This research will provide the teachers with information on which to base curriculum decisions concerning the appropriateness of these types of blocks for enhancing specific social learning situations.

The study of kindergarten play materials is as important today as it was in the early 1900s when Hill (1915) concluded:

> It is sincerely believed that the time has come when all materials and methods must be carefully investigated and those selected which prove to be of actual worth in the development of the kindergarten child. (p. 8)

CHAPTER III
METHODOLOGY

This study investigated the social behavior and levels of social participation of kindergarten children while they played with large hollow blocks and unit blocks. The vague manner in which social behaviors were defined in the previously reviewed studies investigating the relationship between social behavior and play material seriously limits the interpretation of their findings. Therefore, further investigation into this area was needed. Before this research was begun, clear guidelines for defining the social behavior of young children were set forth. The ethological methodology adapted by Appleton (1980), Blurton Jones (1967, 1972b), Hutt and Hutt (1970), Leach (1972), and Smith and Connolly (1972) to investigate the social behavior of preschool children during freeplay provided the guidelines needed for clearer definitions of the units of social behavior.

Defining Social Behavior

Ethology is characterized by its method of direct observation in a naturalistic setting and uses a particular zoological approach which differs from other observational approaches in that behavior is recorded "not in terms of

observables and activity statements" (Hutt & Hutt, 1970). Ethologists place particular importance on the precise definition of the specific behaviors they plan to observe in an attempt to not only bring more objectivity to the study but also to make replication of the study possible. As Blurton Jones (1972a), a noted ethologist, pointed out:

> An incidental result of careful description is the potential replicability of ethological studies. A worker in another laboratory on a different continent can, we claim, read the account of one ethologist and know exactly what behavior to look for, and can therefore repeat earlier studies. This is unfortunately not true of most so-called observational studies of children. Until recently behavior was never described in terms of what the observer saw, but in terms much more of what he thought he meant, or in terms with an intermediate status but of equal vagueness. The early observational studies reported on frequencies of "aggression," or frequencies of "affiliative behavior" but, for example, there is no way to tell what occurrences Green (1933) recorded as "quarrels." Those sorts of categories are still in use in some quarters today, but how does one tell what one observer called aggression or what another called affiliativeness? (p. 12, 13)

In order to obtain more objectivity and precision in observing and reporting the social behavior of young children, ethologists use categories of behavior that represent what they term a unitary concept or unit of behavior. Leach (1972) used the following criteria in determining the units of behavior to use while studying the social behavior of normal and problem preschool children. "(1) The units should be readily definable, and so recognizable to other workers,

and useable by them and (2) the units should have biological meaning, in terms of recognition of social signals between interactants" (p. 252). The definitions of the units of behavior to be observed in this study follow the criteria set forth above by Blurton Jones (1972a), Hutt and Hutt (1970), and Leach (1972). They are reported on page 85 of this chapter.

Naturalistic Observations

> If children's play is to be the subject of analysis it should be studied in some fairly spontaneous setting such as one obtains, for example, within the daily routine of a well-conducted nursery school, rather than under conditions too meticulously controlled. (Bott, 1928, p. 44)

Bronfenbrenner (1979), too, believes if we are to gain a better understanding of children and the way they develop, it is necessary to observe their behavior while they are interacting in a natural setting. The ethological methodology is, as mentioned above, characterized by direct observation of behavior in a naturalistic setting. The ethological studies of Appleton (1980), Blurton Jones (1967, 1972b), Hutt and Hutt (1970), Leach (1972), McGrew (1972), and Smith and Connolly (1972) investigated the social behavior of young children in a naturalistic preschool setting. Hence, the researcher chose to examine the social behavior and social participation of kindergarten children as they played with

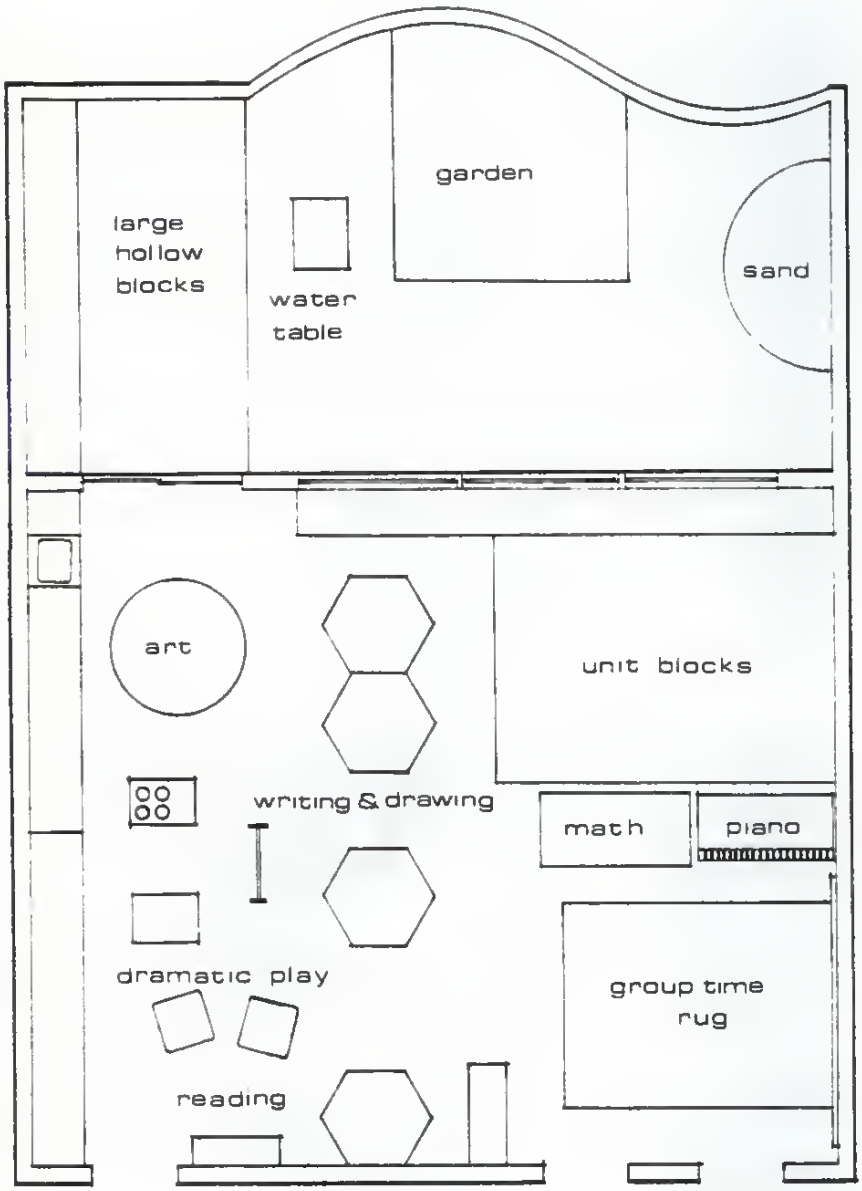
blocks in their own classroom. A description of the classroom setting and of the educational practices of the teacher follows.

The Setting

The kindergarten classroom used in this study was approximately 30'x25' with large windows on the north wall. These windows provided an abundance of natural light and offered a full view of the sandbox, garden, and large hollow block area located outside, adjacent to the north wall of the classroom. The other walls were covered with colorful artwork and stories written by the children. The diagram on page 66 illustrates the layout of the classroom. The room was divided into seven main sections: (1) the rug area, (2) the reading corner, (3) the dramatic play corner, (4) the art area, (5) the unit block area, (6) the writing and drawing area, and (7) the math area.

The rug area, near the front door, was used for large group activities usually directed by the teacher. The reading corner contained big, soft pillows; a large, comfortable chair; and a wide selection of books. Teacher- and child-produced books were available as well as library books.

The dramatic play area provided men's and women's clothing for dressup, a small table with chairs, dolls, dishes, and wooden replicas of an electric range and sink as well as



The Layout of the Classroom

puppets and a puppet stage. During one week of the study, this area was transformed into a "hospital," complete with surgical equipment and a cot.

The art area consisted of a large round table, two easels, and numerous art supplies including tempera paint, crayons, clay, magic markers, construction paper, and scissors. This area was also used for cooking, which took place regularly in this class.

Located next to the windows, the unit block area was defined by a 10' x 12' blue carpet. Approximately 500 unit blocks were available to the children. Included were the basic unit (a 5 1/2" x 2 3/4" x 1 3/8" rectangle), the double unit (a rectangle twice as long as the unit), squares (half units), pillars (quarter units), arches, cylinders, and triangles. Small zoo and farm animals as well as toy planes, cars, and boats were also found here.

The writing and drawing area usually focused on an activity related to the current unit of study, and would include key-word cards, sentence strips, charts, paper and envelopes of various size and shape, markers, pencils, and crayons. Also found in this area were children's personal word lists, stimulating materials, and live animals, all designed to provide concrete, hands-on experiences to encourage language development, writing, and thinking. Aquariums, terrariums, and cages of many different species of plants and animals were also located on shelves and countertops throughout the room.

The math area centered around a small rectangular table and included manipulatives and games. The materials were located on a child-accessible shelf and always available for use.

The back door opened to a 8'x15' covered area where the large hollow blocks were located. This area in turn led to a 20'x15' outside play area which contained a small garden and sandbox. The outside play area was bounded by the classroom on one side, the covered large hollow block area on another, and a 3' serpentine brick wall on the other two sides. All of these inside and outside areas were used regularly by the children during learning center time. This learning center time was from 8:30 a.m. to 10:00 a.m., Tuesday through Friday and 11:30 a.m. to 12:30 p.m. on Mondays and Thursdays.

Educational Practices of the Teacher

During the learning center time the teacher and an aide were always present. Many times a parent volunteer, a student teacher from the University of Florida, or a high school student was also there.

The teacher's role during this activity time varied depending on the number of assistants she had that day and the kind of activities planned. She may have spent the whole period roaming from activity to activity, observing children and taking advantage of "teachable moments" to work with

individuals or groups of children. Specific lessons geared to the needs and interests of the children were carefully planned by the teacher and provided the foundation of the curriculum for the class. The teacher was extremely sensitive to the needs of the children and thus, many learning experiences took place in a meaningful context through spontaneous, indirect instruction. She also directed a cooking, writing, math, or art activity for a group or groups of children or just played with a child in the sandbox or dramatic play area.

The parents, aides, and high school volunteers usually were responsible for either a specific activity (one of the above) or an activity they designed for the children themselves. They read to, played with, or helped the children with specific lessons in math or writing.

The children chose from any of the activities available that day, the only restriction being that each activity was limited to a certain number of children, usually four, at one time. Children could come and go as they wished as long as they obeyed the rule limiting the number of participants and cleaned up before they left an area. Unit blocks, large hollow blocks, the sandbox, dramatic play, the book corner, and some kind of art activity were always available for them to choose from.

A description of the subjects observed and the procedures used for selection of the sample and collection of the data follow.

Subjects

The subjects used in this study were members of the above-mentioned kindergarten class at P.K. Yonge, the laboratory school of the University of Florida in Gainesville. The class was composed of 15 boys, 4 black and 11 white, and 10 girls, 4 black and 6 white, from all three levels of SES: 8 low income, 12 middle income, and 5 high income. The age of the children ranged from five years four months, to six years two months. As is customary at this lab school, children were assigned to classes which are prototypical of Florida's population in terms of race and SES. This classroom was therefore as representative as possible of a typical kindergarten classroom in the State of Florida.

The children were in general rather sophisticated in their block play since they had had the opportunity to play with blocks for over 140 school days before the study began and since most of the children had attended preschools where blocks were available. All of the children had an equal opportunity to play with blocks because the teacher used a learning centers approach in teaching which allowed the children to choose the activity they wanted to do. Most of the activities were limited to four children participating at one time. The unit block and large hollow block areas were two of the learning centers children could choose from since the first day of school.

Selection of the Sample and Grouping

The sample was composed of 20 kindergarten children, all 10 girls in the class and 10 of the 15 boys. The subjects were observed while playing with unit blocks and large hollow blocks in assigned groups, composed of two boys and two girls each. The children were assigned by the teacher to one of five of these mixed-sex groups. In an attempt to maintain naturalistic groupings, the group assignment was made on the basis of what the teacher believed would be the child's probable choice of playmates. The teacher based her decision on her own observations in addition to an earlier questionnaire in which she asked the name of the child's best friend and "who else you would like to play with?"

The best friend and fifth choice (if named) were discarded in an attempt to eliminate those who were too close emotionally or were possibly questionable as really desirable playmates. This procedure hopefully reduced the chances for interpersonal "powerplays" between very close friends or the social uncomfortableness that may occur between less familiar classmates.

This assignment strategy was used in an attempt to make the groups less artificial and contrived than if this relatively small number of subjects had been randomly assigned to groups. The choice of four as the size of each group was decided upon because (1) this was the number of children

that were allowed to play in both the unit and large hollow block areas at one time and (2) observations by the teacher in November and December, 1981, revealed that two boys and two girls commonly played together in both block areas.

Since one of the questions this study investigated was differences between boys' and girls' social behavior and social participation as they played with blocks, it was necessary to have an equal number of children from both sexes in each group. This ensured that the group composition by sex would not affect the observed behavior of the individual children.

Although the researcher was extremely concerned about investigating in a "naturalistic setting" (Bott, 1982; Bronfenbrenner, 1979), he also felt it was more important to observe the social behavior and social participation of those children who played with blocks infrequently. By assigning both boys and girls to groups and by controlling their choice of activity within the context of their normal "learning center time," it allowed the researcher to observe those children who used blocks infrequently as well as the frequent- and non-users of blocks.

Procedure for Observation

The children were observed for a total of 60 minutes per child, 30 minutes for each type of blocks, using a time-sampling technique similar to the one used by Smith and

Connolly (1972). Every child was observed on eight different occasions for 7 1/2 minutes per occasion, four times with unit blocks and four times with large hollow blocks. On each of these eight occasions two observers, the researcher and a trained graduate student, made observations. Each observed the social behavior of one child for a 15-second period, recorded the observed behavior on the checklist then observed another child for 15 seconds. After recording that child's behavior, the observer then observed the first child again for 15 seconds and recorded the behavior exhibited by him/her for that 15-second period. Both observers continued this procedure of alternating 15-second observations until 7 1/2 minutes of data were coded for each child. Each observation session lasted about 30 minutes.

These observations were made during the 8:30 a.m. - 10:10 a.m. learning center time Tuesday through Friday or between 11:30 a.m. and 12:30 p.m. on Monday and Wednesday over the seven week period from April 17 to June 2, 1982. An attempt was made to alternate observations of the groups' use of the two types of blocks. No groups were observed more than once a day or twice each week. The researcher drew lots to decide which group was observed first with unit blocks and which group was observed first with large hollow blocks.

The two observers sat in chairs close enough to the block areas in order to have an unobstructed view of the children and to be able to hear their speech and vocalizations

as clearly as possible. One can never discount the effect of an observer on the behavior of the children (Blurton Jones, 1967), therefore each observer attempted to follow the suggestions set forth by McGrew (1972). McGrew suggested that the observers should not intentionally "initiate interaction" with the children nor should they become "totally detached" or "withdrawn" or what he termed "unnaturally wooden," but should instead "attempt to compromise" by not initiating the social contact with children. If a child initiated social interaction with the observer, however, he/she did not refuse, but rather tried to terminate it "as gracefully as possible." In addition, both observers spent several weeks prior to the beginning of the study observing in the classroom so the children would become familiar with them and their role as "unresponsive" adult visitors. It should also be mentioned that adult visitors and student observers were quite common in this particular classroom.

The observed behavior was recorded on a checklist developed by the researcher. A compilation of the social behavior of preschool children observed by Appleton (1980), Blurton Jones (1967, 1972b), Leach (1972), McGrew (1972), Parten (1932), and Smith and Connolly (1972) during freeplay was included on this checklist. The potential for these behaviors occurring in the context of kindergartners' block play was substantiated by the researcher during frequent

observations of kindergarten children playing with large hollow and unit blocks, made in late 1981 and early 1982. In addition, the researcher has expanded the units of behavior in the "speech" categories of Leach (1972) and Smith and Connolly (1972) to include units of verbal behavior observed during the above-mentioned observations of the block play of kindergarten boys and girls.

Inter-Observer Agreement

The mean inter-observer agreement on all categories of this checklist was 76.5% for unit blocks and 81.5% for large hollow blocks between two independent judges, the author and a graduate student assistant. The agreement ranged from 71% to 86.5% for unit blocks and 75.5% to 87% for large hollow blocks. The calculations were based on the number of agreements divided by the total of the greatest number of behaviors scored by one observer for each 15-second period.

Two agreement checks were made for each type of blocks before the coding began. Additionally, six more agreement checks with unit blocks and four more checks with large hollow blocks were made during the study.

In order to collect data in an accurate, objective, and consistent manner an observational technique appropriate for the setting, the situation, and the questions posed by this study had to be found. The following section describes the choice of observation techniques and the reason for this choice.

The Time-Sampling Technique

The time-sampling technique was chosen as the most appropriate method of data collection for observing the social behavior and social participation of kindergarten children during block play. According to Vasta (1979) the time-sampling technique is:

> the most advanced and most sophisticated of our current observational approaches. It objectifies human observational procedure more than any other method, more importantly, it permits an accurate assessment of the reliability of the observations. (p. 173)

Besides bringing objectivity and reliability to the observational procedure, another advantage of the time-sampling technique is that, used in conjunction with ethological methodology, it "allows a comparison of measures of behavior frequency, obviously defined, for different individuals and different settings" (Smith & Connolly, 1972, p. 70).

Leach (1972) maintained that using a time-sampling technique with the predetermined behaviors listed on a checklist has certain advantages: (1) "It should provide a more consistent record because the items being recorded are constantly before one's eyes; and (2) the data are recorded in a form which is easy to analyze" (p. 250). However, as Leach pointed out, a checklist does have three limitations: (1) it is somewhat inflexible--since a complete list of the behaviors to be recorded is listed in advance, (2) it must

be relatively brief, so as not to become unwieldy, and (3) it doesn't readily allow for recording the sequence of behavior.

The checklist to record the behaviors observed during the 15-second time intervals was designed by the researcher to reduce the limitations cited by Leach. A space was provided on the checklist, marked Other Behavior, to record any unlisted social behavior that might occur during each 15-second period. Although having the predetermined units of behavior listed right in front of the observer is certain to influence his/her coding behavior; providing the opportunity to record behavior not listed on the checklist gives it more flexibility. Leach is certainly correct in pointing out that a checklist should be somewhat brief; however, as explained in greater detail below, the researcher's checklist was designed with the smaller units of behavior listed under more global behavioral categories in order to aid the observers and simplify the recording procedure. The major weakness of the researcher's checklist and the time-sampling technique is that it does not allow for recording the sequence of behavior.

In deciding on an observational technique, all of the above factors were carefully weighed by the researcher. The use of the time-sampling technique and a checklist to record the observed behavior was deemed to be the most appropriate method for observing and recording the social behavior of

kindergarten children because of the objectivity, consistency, and accuracy that characterize this observational procedure. The choice of 15 seconds as the length of time interval will be discussed below.

Length of the Time Interval

The choice of the 15-second time intervals was primarily based on the following guidelines set forth by Hutt and Hutt (1970): (1) "how often the sampling is done will depend on how rapidly the changes in behavior occur" (p. 68), (2) in general, the smaller the time sample, the more representative the sampling, (3) fractions of a minute (10, 15, 20, or 30 seconds) are preferable in terms of computational ease, and (4) although the more frequent the sampling the more comprehensive and reliable the record, a large number of categories requires the frequency to be reduced.

Taking Hutt and Hutt's first guideline into consideration, it should be noted that many of the units of social behavior listed on the researcher's checklist (for example, Hit/Push, Give, Smile), occur very quickly and change rapidly within a few seconds. A child may hit and push, then grab another child's block within a three-second period of time.

Using Hutt and Hutt's second, third, and fourth guidelines, a 15-second--as opposed to a 10-second--time interval was chosen because of the moderately large number of

behaviors listed. Larger time intervals (20 or 30 seconds) were not selected because, although the number of specific units of social behavior on this checklist are fairly large, the chances of more than one unit of social behavior in the Facial Expressions and Vocalizations and Level of Social Participation categories occurring during any 15-second period was highly unlikely. Hence, by grouping the specific units of social behavior under the four major behavioral categories (Action Behavior, Verbal Behavior, and Facial Expression and Vocalizations, and Levels of Social Participation), the list of predetermined behaviors was organized in such a manner so as to reduce the problems involved in scanning the large number of behavioral categories found in a checklist of comparable length.

Gottfried and Seay (1973), in a direct observational study of peer-social and object-directed behavior of preschool children, recorded the occurrence of social and object-directed behavior once during each 15-second interval. Their checklist contained many of the same social behaviors the researcher included on his checklist (i.e., "hit," "touch," "smile," "frown," "vocalize," "verbalize"), adding support for the use of a 15-second time interval for observing the social behavior of young children.

For the purpose of studying the social and cognitive play behavior of preschool children, Johnson, Ershler, and Bell (1980) defined a "play episode" as being a "unit of

observation of at least 15-seconds duration with only one type of social/cognitive play occurring" (p. 272). Their definition of "play episode" upholds the use of a 15-second time interval as an appropriate length of time to determine the observed child's level of social participation (social play), whereas a 10-second interval may not be enough time to reveal the particular level of social participation in which the child is engaged.

In summary, the 15-second time interval was selected because it was deemed the smallest unit of time (Hutt & Hutt, 1970) appropriate for the observation of social behavior (Gottfried & Seay, 1973) and social participation (Johnson et al., 1980) of young children. Also, the fact that a minute can easily be divided into 15-second periods makes this time length preferable in terms of computational ease (Hutt & Hutt, 1970).

The following section will discuss the method of observing social participation and further define this term and the behaviors associated with it.

Observation of Social Participation and Block Area Participation

In addition to recording the units of social behavior, the observers also recorded the children's level of social participation and block area participation. All levels of social participation except Inside Structure were adapted from those developed by Parten (1932) and used by Smith and

Connolly (1972). The block area participation variable (Not Present) was utilized by the researcher to measure the amount of time the children spent in each block area. The procedure used to score these two categories is outlined below.

During each 15-second period the target child's play behavior was scored by coding it either as Group, Parallel, Solitary, Onlooker, Unoccupied, or Inside Structure. For example, if the target child was a girl building a house by herself with blocks while the other three children were building a road, and she showed no observable interest in the others or in their structure, she was scored for Solitary play during that 15-second period. If the next target child happened to be a boy playing next to, but not interacting with, the other two children and all were building a road, he was scored as participating in Parallel play for that 15-second period. Inside Structure was scored only during large hollow block play when a child could not be seen because he/she was inside a block structure.

Not Present, was coded if: (1) the child left the block area before 10 seconds of the 15-second period had elapsed, (2) the child was not in the block area during the 15-second period in which that child was scheduled to be observed, or (3) the child was not present and did not appear before the first 5 seconds of the scheduled 15-second coding period had elapsed. The child had to be engaged in play or non-play

behavior at one of these social levels of participation for a period of 10 seconds before the observer scored him/her at a level of social participation.

Inside Structure is a category developed by the researcher for observing children in one specific activity area, the block corner. Parten did not need this category since she observed the children in the context of the entire preschool classroom. Parten's associative and cooperative play categories were collapsed into Group play because previous studies (Johnson & Ershler, 1981; Johnson et al., 1980; Rubin, Watson, & Jambor, 1978; Smith & Connolly, 1972) reported observers had a great deal of difficulty distinguishing between the associative and cooperative play behaviors and thus inter-observer agreement was very low for these two categories. Solitary and Parallel play were redefined to fit the block play situation while Unoccupied and Onlooker, also taken from Parten's (1932) study, were used as redefined by Smith and Connolly (1972). More detailed definitions of the levels of social participation follow.

Definitions of Levels of Social Participation

Unoccupied is recorded when the child is engaged in minimal activity, either physically or socially, such as

standing around, talking softly to self, looking around the room, sucking fingers, or doing some simple, repetitious, non-essential task unrelated to the activity of the other children in the block area. The Unoccupied child does not interact with the other children or take part in the play behavior of these children.

Onlooker is recorded when the child watches others play, follows them around the block area, or stands or sits within speaking distance so that he/she can easily see and hear what is taking place. The child may talk to the children whom he/she is observing, ask questions, or give suggestions but does not overtly enter into the play of the others.

Solitary is recorded when the child plays alone and independently. There is no interaction with or interest in other children or with their block structures or designs; the child makes no effort to keep close to or speak to other children. The child's interest is centered on his/her own behavior which is pursued without reference to what others are doing. If the child is building a structure or making a pattern or design with blocks, it is different than what the others are doing and there is no evidence that he/she was influenced by the other children's block-building behavior.

Parallel is recorded when the child plays independently but the behavior chosen naturally brings the child among

other children. The child does not attempt to influence the behavior of nearby children but exhibits an interest in what the nearby children are doing, exemplified by occasional glances and similarity of block structure or building technique. The child plays beside, rather than with, other children.

Group is recorded when the child plays with other children, interacting with them. Interactions here include conversation, borrowing or sharing blocks or accessories, following or chasing one another in the block area, physical contact, building a structure together, and organized play involving different roles.

Inside Structure is recorded when the child climbs inside a block structure and cannot be seen by the observer. This only occurs during play with large hollow blocks.

Definition of Block Area Participation

Not Present is recorded when: (1) the child is not in the block area during any part of the 15-second time interval for which the child is scheduled to be observed, (2) the child leaves the block area before 10 seconds of the 15-second time interval have elapsed, or (3) the child is not present in the block area and does not appear before the first 5 seconds of the scheduled 15-second time interval have elapsed.

Definitions of the Units of Social Behavior

As mentioned earlier, many of these definitions were taken from the ethological studies of the social behavior of preschool children. The source for each definition is cited after each unit of social behavior is defined. Where no source is cited, the unit of behavior has been defined by the researcher.

The specific units of social behavior are listed under three major behavioral categories (Action Behavior, Verbal Behavior, and Facial Expressions and Vocalizations) for organizational ease in coding and analyzing the data.

Verbal Behavior

Accept is recorded when the child verbally agrees with a comment or suggestion of another child.

Announce is recorded when the child verbally makes known to others what he/she is about to do or has done.

Apologize is recorded when the child verbally acknowledges regret for a fault, injury, or insult to another.

Ask/Offer/Suggest is recorded when the child utters a string of words, usually with a rising inflection (i.e. asking a question, "May I have that block?"), when the child verbally volunteers aid to help solve a problem, or when the child volunteers ideas for the use of blocks or accessories.

Blame/Complain/Condemn is recorded when the child verbally accuses another child, verbally expresses discontent, or verbally declares another child's action or block structure as being substandard.

Comfort/Praise is recorded when the child verbally consoles another child or verbally commends or applauds the actions of another child.

Command is recorded when the child utters a string of words conveying an order, spoken emphatically and usually rather loudly (Leach, 1972).

Refuse/Deny/Negate is recorded when the child verbally attempts to stop another child entering the group or playing with the blocks or accessories.

Talk is a blanket term that is recorded when the child utters one or more recognizable words obviously aimed at communicating with another child but not including Ask/Offer/Suggest, Call for Teacher, Comfort/Praise, Command, Refuse/Deny/Negate, and Thank.

Threat is recorded when the child verbally expresses the intention to: (1) inflict injury to another child, (2) damage another child's block structure, or (3) tattle to the teacher.

Action Behavior

Give is recorded when an object, held in the child's hand or hands, is held out for another person to grasp and

is then released; when an object is placed on another child's lap (Leach, 1972); or, in the case of large hollow blocks, when an object is placed at another's feet.

Fight is recorded when the child engages in repeated pushing or pulling or exchanges several blows with another child.

Help is recorded when the child assists another to perform some manipulative game or task by a complex array of actions (showing, taking from and doing for, giving, arranging blocks or other small objects), often accompanied by verbal instructions as well (Leach, 1972).

Hit at is recorded when the child attempts to strike another child in an agonistic context but does not make contact with the attempted blow.

Hit/Push is recorded when the child strikes another child in an agonistic context or when a child repels another child by flexing the arm(s) and then extending it.

Imitate/Take Turns is recorded when the child copies the behavior of another child or alternates using the blocks, using a block structure, or portraying a fantasy role in a play situation.

Receive is recorded when the child holds out his/her hands in order to grasp an object which is being given by someone. It involves coordinated movements with the giver (Leach, 1972).

Reject is recorded when the child physically (not verbally) refuses physical contact or an object held out by another child.

Rough and Tumble is recorded when the child engages in non-agonistic physical roughhousing with another child such as a play fight.

Take/Tug/Pull is recorded when the child either grabs an object from someone's hands (or an object that child is obviously using) when they have not held it out towards the subject or when the child is holding and attempting to draw toward him- or herself an object which another is holding.

Throw is recorded when the child has an object in its grasp; the arm is flexed and then abruptly extended, and the object is released.

Touch is recorded when the child places one hand on another child's body, without grasping it. The hand may be placed just for a moment, or it may be rested on the person for a long period (up to a minute) (Leach, 1972).

Facial Expressions and Vocalizations

Cry/Scream is recorded when the child vocalizes in a repeated, usually low-pitched manner ("waah," "aaah-hah") or vocalizes in a single or repeated high-pitched manner, excluding squeals occurring in a play context (Smith & Connolly, 1972).

Frown is recorded when the child's brows are drawn down at center, making vertical creases in the forehead while the eyes are usually well open (Leach, 1972).

Laugh is recorded when the child exhibits open-mouthed smile together with audible vocalization (rapid or staccato expulsions of breath) (Smith & Connolly, 1972).

Playnoise is recorded when the child vocally imitates such things as machines: shooting, planes, rockets, trains, car. It is a "blanket term" to cover a range of noises used by the child during play. Stereotyped chants, such as "I am a dalek, I am a dalek," also come under this heading (Leach, 1972).

Pout is recorded when the child protrudes the lips and squints the eyes in a gesture of obvious displeasure.

Smile is recorded when the corners of the mouth are withdrawn and turned upwards. No distinction is made as to mouth open or closed, teeth visible or not. No audible vocalization (Smith & Connolly, 1972).

Definitions of Teacher-Directed Behavior and Teacher Intervention Behavior

The teacher may be an influence on children's social behavior. If a child has a problem, one possible solution is to appeal to the teacher for help. The two teacher-directed behavior variables were included in the observation

checklist so this type of behavior could be recorded. Similarly, a teacher may notice a problem in a play area and intervene to prevent a potential disruption. Because teacher intervention may be related to the content of the play or to potentially unacceptable behavior, two teacher intervention behavior variables were included. These four variables are defined below.

Call Teacher is recorded when the child verbally requests or demands that the teacher give help to or aid the child in some way.

Get Teacher is recorded when the child leaves the block area to go after the teacher.

Teacher-Behavior is recorded when the teacher intervenes in the group because of what she considers unacceptable behavior by the child(ren).

Teacher-Content is recorded when the teacher intervenes to comment on or ask questions about the children's block structures or their play activities.

Description of Observational Checklist

An example of the checklist used by the author is presented in Appendix A. This example represents one 15-second time interval. One check mark is made in the appropriate box if the behavior occurs one or more times during that 15-second period. The author reduced this format so that four

of these checklists could be included on one page. Each observer then alternately recorded two 15-second time intervals before turning to a new page.

Summary

The use of vague definitions of social behavior and inconsistent observation procedures made the findings of earlier studies investigating the relationship between play materials and social behavior hard to interpret and difficult to replicate. The present study was designed with these weaknesses in mind, in order to supplement the findings from these other studies.

Bronfenbrenner (1979) believed it necessary to observe children in a naturalistic environment to gain a better understanding of the nature and function of their behavior. An ethological approach to studying the social behavior of kindergarten children during block play was deemed the most appropriate methodology for this study because it utilizes direct observation in a naturalistic setting and because of the particular importance ethologists place on the precise definition of the social behaviors to be studied.

The time-sampling technique, described by Vasta (1979) as "the most advanced and sophisticated of our current observational approaches" (p. 173) was used for data collection because it provides an accurate, consistent, and

objective record of the behaviors observed. This technique also complements the precise behavioral definitions and the naturalistic observation procedure of the ethological methodology. Together they provide a strong and sophisticated methodological approach that has been successfully utilized in observing the social behavior of young children (Smith & Connolly, 1972).

In summary, the method of direct observation in the classroom setting, using a time-sampling technique and a checklist of predetermined, precisely defined units of social behavior and levels of social participation, was used in this study. The methods described above were appropriate for the investigation of social behavior occurring during block play and provided the necessary information for future replication.

CHAPTER IV
RESULTS

Introduction

A 2 (type of blocks) x 2 (sex) x 4 (time) completely repeated measures of analysis of variance (ANOVA) was used to analyze the data. This analysis was conducted for each of the six social participation variables, one block area participation variable, 28 social behavior variables, and 2 teacher-directed behavior variables. The scores used in the analysis were the average boys' score and the average girls' score for each of the five groups. This procedure was used because the behavior of any one child within a group is likely to be dependent on the behavior of the other children within the group and the statistical procedure takes this dependency into account. Observations of groups of children during this study supported the use of this procedure. In addition, two teacher intervention behavior variables were analyzed by a 2 (type of blocks) x 4 (time repeated measures ANOVA procedure. For each type of blocks and occasion (time) the score on each variable was the number of interventions to a group as a whole, not the number of interventions to a particular child. All variables were tested at a .05 level of significance.

Findings

The presentation of findings which follows includes four major sections. The first section analyzes the six social participation, one block area participation variable, and 28 social behavior variables comparing differences by type of blocks. The differences and similarities in the social participation and social behaviors of boys versus girls with each type of blocks are presented in the second section. The third section reports all other statistically significant effects for the 2 (type of blocks) x 2 (sex) x 4 (time) ANOVAs of the six social participation, one block area participation, and 28 social behavior variables. The fourth reports and discusses the results of the 2 (type of blocks) x 4 (time) ANOVAs of the two teacher intervention variables.

Social Participation, Block Area Participation, and Social Behavior by Type of Blocks

Social participation by type of blocks. For each of the six social participation variables, Table 2 reports the marginal means for each type of blocks. The marginal means indicate the frequency of occurrence of each level of social participation per observation. For example, Group has a marginal mean frequency of 17.00 for large hollow blocks. This indicates that over four sessions of large hollow block play Group was scored an average of 17 times for each child per 7 1/2 minute observation period. In other words,

Table 2. Type of Blocks Marginal Mean Frequencies of Social Participation Variables

Large Hollow Blocks		Unit Blocks
Level of Social Participation		
Solitary	1.54	4.33
Parallel	1.98	3.66
Group	17.00	10.61
Onlooker	1.73	1.28
Unoccupied	0.45	0.28
Inside Structure*	2.16	0.00

*As a result of the smaller size of unit blocks, Inside Structure can only occur with large hollow blocks.

during each observation period, Group was recorded an average of 17 15-second intervals out of the possible 30 15-second intervals for each child during large hollow block play. The marginal means can be interpreted in the same manner for both large hollow and unit block play for all of the six social participation variables, the block area participation variable, and the 28 social behavior variables reported in this chapter.

Group was the most frequently occurring level of social participation for both types of block play. For unit block play, the levels of social participation ranked from most to least frequently occurring were Group, Solitary, Parallel, Onlooker, and Unoccupied. For large hollow block play, the ranking was as follows: Group, Inside Structure, Parallel, Onlooker, Solitary, and Unoccupied. Inside Structure is only applicable to large hollow blocks because unit blocks are too small to build a child-sized enclosed structure. Appendix B reported the cell frequencies and cell standard deviations for these six, as well as all other dependent variables in the study.

Table 3 summarizes the ANOVAs for the differences between types of blocks for five of the levels of social participation. Differences between types were significant at a .05 level for the variables Solitary, Parallel, Group, and Unoccupied. Inside Structure was not tested for

Table 3. Summary of Type of Blocks ANOVAs for Social Participation Variables.

DV	SV	SS	DF	MS	F	P
Solitary	Type of Blocks	155.40	1	155.40	22.14	0.0093
	Error	28.08	4	7.02		
Parallel	Type of Blocks	56.95	1	56.95	8.37	0.0444
	Error	27.22	4	6.80		
Group	Type of Blocks	816.00	1	816.00	10.30	0.0326
	Error	316.95	4	79.24		
Onlooker	Type of Blocks	4.05	1	4.05	1.43	0.2983
	Error	11.36	4	2.84		
Unoccupied	Type of Blocks	0.61	1	0.61	12.25	0.0249
	Error	0.20	4	0.05		

statistical significance since this behavior could occur only with large hollow blocks. Group and Unoccupied occurred more often with large hollow blocks. Solitary and Parallel were recorded more often when children played with unit blocks.

Block area participation by type of blocks. The marginal means for each type of blocks for the block area participation variable (Not Present) are reported in Table 4. During each of the four observations, children were Not Present in the large hollow block area an average of 4.16 out of 30 15 second-intervals. In the unit block area the children were Not Present for an average of 9.57 out of 30 15-second intervals. Therefore, the children were present an average of 25.84 and 20.43 out of 30 15-second intervals for large hollow and unit blocks, respectively.

Table 5 summarizes the ANOVA for the differences between types of blocks for the block area participation variable (Not Present). There is a significant difference at a .05 level between the Not Present scores for large hollow blocks and unit blocks. Children were recorded as Not Present significantly more frequently for unit block play than for large hollow block play. Stated another way, children were present significantly more often for large hollow block play than for unit block play.

Table 4. Type of Blocks Marginal Mean Frequencies of the Block Area Participation Variable (Not Present)

Large Hollow Blocks	Unit Blocks
4.16	9.52

Table 5. Summary of Type of Blocks ANOVA for Block Area Participation (Not Present)

SV	SS	DF	MS	F	P
Type of Blocks	546.01	1	546.01	24.17	0.0008
Error	90.36	4	22.59		

Social behavior by type of blocks. The marginal means for each type of blocks for each of the 28 social behavior variables are reported in Table 6. The marginal means for each variable for large hollow blocks are listed by rank order of frequency of occurrence from most to least frequently occurring behavior. The unit block marginal means are listed opposite the large hollow block means to facilitate comparison between the two types of blocks.

Table 7 summarizes the ANOVAs for differences between types of blocks for all 28 social behavior variables. When comparing the two types of blocks there are significant differences at a .05 level for Accept, Apologize, Ask/Offer/Suggest, Refuse/Deny/Negate, and Smile. Each of these social behavior variables occurred more often with large hollow blocks than with unit blocks. As has been noted, however, the rank orders of frequency of occurrence of these variables are similar for the two types of blocks.

Social Participation, Block Area Participation, and Social Behavior of Children by Sex

There are no sex differences for each of the six levels of social participation, for block area participation, or for the 28 social behavior variables (see Tables 8, 9, and 10 for the ANOVAs with regard to gender). Table 9 indicates that there was no significant difference in the amount of time girls and boys spent playing with blocks. Tables 8

Table 6. Type of Blocks Marginal Mean Frequencies of Social Behavior Variables

Social Behavior	Large Hollow Blocks	Unit Blocks
Ask/Offer/Suggest	7.86	5.39
Playnoise	5.50	5.54
Smile	4.95	2.39
Talk	4.15	2.33
Announce	3.38	2.61
Imitate/Take turns	2.16	0.64
Accept	2.11	1.00
Laugh	2.06	0.75
Refuse/Deny/Negate	1.85	0.93
Blame/Complain/Condemn	1.64	1.20
Command	1.38	0.55
Help	1.09	0.54
Give	0.95	0.85
Receive	0.68	0.53
Threat	0.39	0.23
Touch	0.31	0.19
Frown	0.31	0.26
Take/Tug/Pull	0.09	0.41
Hit/Push	0.15	0.04
Throw	0.15	0.19
Rough and Tumble	0.10	0.03
Comfort / Praise	0.09	0.05
Apologize	0.05	0.00
Cry/Scream	0.04	0.01
Pout	0.03	0.00
Hit at	0.03	0.00
Reject	0.01	0.00
Fight	0.00	0.00

Table 7. Summary of Type of Blocks ANOVAs for Social Behavior

DV	SV	SS	DF	MS	F	P
		Verbal Behavior				
Accept	Type of Blocks	24.75	1	24.75	11.18	0.0287
	Error	8.86	4	2.21		
Announce	Type of Blocks	11.63	1	11.63	5.44	0.0800
	Error	8.54	4	2.14		
Apologize	Type of Blocks	0.05	1	0.05	16.00	0.0161
	Error	0.01	4	0.003		
Ask/Offer/Suggest	Type of Blocks	122.51	1	122.51	7.91	0.0482
	Error	61.96	4	15.49		
Blame/Complain/Condemn	Type of Blocks	3.83	1	3.83	1.79	0.2521
	Error	8.56	4	2.14		
Comfort/Praise	Type of Blocks	0.03	1	0.03	0.64	0.4676
	Error	0.18	4	0.04		
Command	Type of Blocks	13.61	1	13.61	5.74	0.0746
	Error	9.48	4	2.37		
Refuse/Deny/Negate	Type of Blocks	16.65	1	16.65	86.65	0.0007
	Error	0.77	4	0.19		
Talk	Type of Blocks	66.61	1	66.61	14.72	0.0185
	Error	18.11	4	4.53		
Threat	Type of Blocks	0.53	1	0.53	2.07	0.2233
	Error	1.02	4	0.25		

Table 7. Continued.

DV	SV	SS	DF	MS	F	P
		Action Behavior				
Give	Type of Blocks	0.20	1	0.20	0.43	0.5480
	Error	1.86	4			
Fight	Type of Blocks	0.00	1	0.00	0.00	1.0000
	Error	0.00	4	0.00		
Help	Type of Blocks	6.05	1	6.05	5.81	0.0736
	Error	4.17	4	1.04		
Hit at	Type of Blocks	0.003	1	0.003	0.29	0.6213
	Error	0.04	4	0.01		
Hit/Push	Type of Blocks	0.25	1	0.25	7.36	0.0533
	Error	0.14	4	0.03		
Imitate/Take Turns	Type of Blocks	46.51	1	46.51	6.47	0.0638
	Error	28.77	4	7.19		
Receive	Type of Blocks	0.45	1	0.45	1.29	0.3192
	Error	1.39	4	0.35		
Reject	Type of Blocks	0.003	1	0.003	1.00	0.3739
	Error	0.01	4	0.003		
Rough and Tumble	Type of Blocks	0.11	1	0.11	2.25	0.2080
	Error	0.20	4	0.05		
Take/Tug/Pull	Type of Blocks	0.01	1	1.01	0.95	0.3852
	Error	4.27	4	1.07		
Throw	Type of Blocks	0.03	1	0.03	0.07	0.8029
	Error	1.58	4	0.40		

Table 7. Continued.

DV	SV	SS	DF	MS	F	P
Touch	Type of Blocks	1.01	1	1.01	2.91	0.1635
	Error	1.39	4	0.35		
	Facial Expressions and Vocalizations					
Cry/Scream	Type of Blocks	1.01	1	0.01	2.67	0.1778
	Error	0.02	4	0.01		
Frown	Type of Blocks	0.05	1	0.05	0.35	0.5870
	Error	0.58	4	0.14		
Laugh	Type of Blocks	34.45	1	34.45	24.10	0.0080
	Error	5.72	4	1.43		
Playnoise	Type of Blocks	0.03	1	0.03	0.00	0.9741
	Error	94.11	4	23.53		
Pout	Type of Blocks	0.01	1	0.01	1.00	0.3739
	Error	0.05	4	0.01		
Smile	Type of Blocks	131.33	1	131.33	10.74	0.0306
	Error	48.91	4	12.23		

Table 8. Summary of Sex ANOVAS for Social Participation

DV	SV	SS	DF	MS	F	P
Solitary	Sex	0.70	1	0.70	0.02	0.8832
	Error	114.72	4	28.68		
Parallel	Sex	3.83	1	3.83	0.56	
	Error	27.21	4	6.80		
Group	Sex	12.40	1	12.40	0.10	0.7652
	Error	485.61	4	121.40		
Onlooker	Sex	0.05	1	0.05	0.02	0.8965
	Error	10.42	4	2.60		
Unoccupied	Sex	0.05	1	0.05	0.03	0.8642
	Error	6.01	4	1.50		

Table 9. Summary of Sex ANOVA for Block Area Participation (Not Present)

SV	SS	DF	MS	F	D
Sex	1.01	1	1.01	0.03	0.8811
Error	159.01	4	39.87		

Table 10. Summary of ANOVA's for Social Behavior

DV	SV	SS	DF	MS	F	P
		Verbal Behavior				
Accept	Sex	9.45	1	9.45	1.47	0.2915
	Error	25.66	4	6.41		
Announce	Sex	8.13	1	8.13	1.00	0.3737
	Error	32.48	4	8.12		
Apologize	Sex	0.01	1	0.01	1.00	0.3739
	Error	0.05	4	0.01		
Ask/Offer/Suggest	Sex	1.51	1	1.51	0.05	0.8362
	Error	124.26	4	31.07		
Blame/Complain/Condemn	Sex	0.03	1	0.03	0.01	0.9417
	Error	18.55	4	4.64		
Comfort/Praise	Sex	0.03	1	0.03	1.00	0.3739
	Error	0.11	4	0.03		
Command	Sex	1.25	1	1.25	0.42	0.5523
	Error	11.91	4	2.98		
Refuse/Deny/Negate	Sex	2.63	1	2.63	0.59	0.4843
	Error	17.64	4	4.43		
Talk	Sex	1.25	1	1.25	0.07	0.8055
	Error	72.28	4	18.07		
Threat	Sex	0.08	1	0.08	15.64	0.0167
	Error	0.22	4	0.05		

Table 10. Continued.

DV	SV	SS	DF	MS	F	P
		Action Behavior				
Give	Sex	0.80	1	0.80	0.21	0.6720
	Error	15.39	4	3.85		
Fight	Sex	0.00	1	0.00	0.00	1.0000
	Error	0.00	4	0.00		
Help	Sex	0.05	1	0.05	0.03	0.8775
	Error	7.42	4	1.85		
Hit at	Sex	0.003	1	0.003	0.29	0.6213
	Error	0.04	4	0.01		
Hit/Push	Sex	0.003	1	0.003	0.02	0.9001
	Error	0.70	4	0.18		
Imitate, Take Turns	Sex	6.05	1	6.05	2.79	0.1701
	Error	8.76	4	2.17		
Receive	Sex	0.05	1	0.05	0.04	0.8562
	Error	5.36	4	1.34		
Reject	Sex	0.003	1	0.003	1.00	0.3739
	Error	0.01	4	0.003		
Rough and Tumble	Sex	0.11	1	0.11	6.00	0.0705
	Error	0.08	4	0.02		
Take/Tug/Pull	Sex	1.25	1	1.25	3.72	0.1260
	Error	1.34	4	0.34		
Throw	Sex	1.38	1	1.38	2.87	0.1653
	Error	1.92	4	0.48		

Table 10. Continued.

DV	SV	SS	DF	MS	F	P
Touch	Sex	0.50	1	0.50	1.88	0.2420
	Error	0.11	4	0.03		
	Facial Expressions and Vocalizations					
Cry/Scream	Sex	0.01	1	0.01	2.67	0.1778
	Error	0.02	4	0.01		
Frown	Sex	0.01	1	0.01	0.12	0.7489
	Error	0.42	4	0.11		
Laugh	Sex	10.88	1	10.88	0.73	0.4415
	Error	59.73	4	14.93		
Playnoise	Sex	147.15	1	147.15	4.24	0.1087
	Error	139.00	4	34.75		
Pout	Sex	0.01	1	0.01	1.00	0.3739
	Error	0.05	4	0.01		
Smile	Sex	0.70	1	0.70	0.02	0.8846
	Error	117.53	4	29.38		

and 10 provide evidence that the boys' and girls' levels of social participation and social behavior were similar during their play with these two types of blocks.

Other Findings

Time. The results of the ANOVA with regard to date of observation showed that the variables Unoccupied, Ask/Offer/Suggest, Comfort/Praise, and Cry/Scream exhibit statistically significant changes in frequency over time. Table 11 reports the summary of the ANOVAs with regard to time for these four variables.

The marginal means for Unoccupied, Ask/Offer/Suggest, Comfort/Praise and Cry/Scream for each observation time are reported in Table 12. These results would appear to indicate that there was no consistent change in behavior over time and that differences were more dependent on the occasion and not on the experience with blocks or the group. For example, Unoccupied Time 1 is similar to Time 3 and Time 2 is similar to Time 4, which may indicate that the particular occasion influenced the behavior and not that the behavior changed consistently over time. It is important to note the children in this study were observed for only seven weeks.

Interactions. Table 13 indicates a significant type of blocks x sex interaction for Help. The marginal means in Table 14 indicate that girls were more likely to help

Table 11. Summary of Time ANOVAs for Unoccupied, Ask/Offer/Suggest, Comfort/Praise, and Cry/Scream.

DV	SV	SS	DF	MS	F	P
Unoccupied	Time	1.06	3	0.35	3.58	0.0468
	Error	1.19	12	0.10		
Ask/Offer/Suggest	Time	88.20	3	29.40	5.43	0.0136
	Error	64.96	12	5.41		
Comfort/Praise	Time	0.33	3	0.11	4.86	0.0194
	Error	0.28	12	0.02		
Cry/Scream	Time	0.08	3	0.03	3.69	0.0431
	Error	0.08	12	0.01		

Table 12. Time Marginal Means for Unoccupied, Ask/Offer/Suggest, Comfort/Praise, and Cry/Scream.

DV	Time 1	Time 2	Time 3	Time 4
Unoccupied	0.50	0.28	0.45	0.23
Ask/Offer/Suggest	5.58	7.68	5.58	7.68
Comfort/Praise	0.05	0.18	0.00	0.05
Cry/Scream	0.30	0.00	0.03	0.00

Table 13. Summary of Type of Blocks X Sex ANOVAs for Help

DV	SV	SS	DF	MS	F	P
Help	Type of Blocks x sex	4.51	1	4.51	8.67	0.0422
	Error	2.08	4	0.52		

Table 14. Type of Blocks Marginal Means for Help

Type of Blocks	Males	Females
Large Hollow	0.80	1.35
Unit	1.00	0.33

Table 15. Summary of Sex x Time ANOVA's for Cry/Scream and Frown

DV	SV	SS	DF	MS	F	P
Cry/Scream	Sex x Time	0.11	3	0.04	4.24	0.0294
	Error	0.11	12	0.01		
Frown	Sex x Time	1.91	3	0.63	4.31	0.0279
	Error	1.78	12	0.15		

when playing with large hollow blocks while boys helped more often during unit block play. These findings should be interpreted cautiously however, since Help was a low frequency of occurrence behavior.

The analysis with regard to sex x time interactions resulted in significant interactions for Cry/Scream and Frown. The ANOVAs for these interactions are summarized in Table 15. The marginal means for each combination of sex and time reported in Table 16 show that Cry/Scream decreased for girls over time while Frown increases for girls over time. Cry/Scream almost never occurred with either sex; therefore these particular findings have little meaning. Frown, like the other time interactions discussed, appears to be more influenced by the particular occasion than by past experience playing with blocks.

The analysis resulted in a significant type of blocks x sex x time interaction for Take/Tug/Pull. The summary of ANOVA for this interaction is reported in Table 17. The marginal means reported in Table 18 show that boys' Take/Tug/Pull behavior increased over time for boys playing with unit blocks. These results must be carefully interpreted. The low frequency and pattern of the behavior seem to imply that the particular occasion contributed more than past block experiences to the likelihood of Take/Tug/Pull occurring.

Table 16. Sex x Time Marginal Means for Cry/Scream and Frown.

DV	Sex	Time 1	Time 2	Time 3	Time 4
Cry/Scream	M	0.00	0.00	0.03	0.00
	F	0.08	0.00	0.00	0.00
Frown	M	0.15	0.05	0.35	0.05
	F	0.13	0.10	0.10	0.23

Table 17. Summary of Type of Blocks x Sex x Time ANOVA for Take/Tug/Pull

SV	SS	DF	MS	F	P
Type of Blocks x Sex x Time	2.23	3	0.75	4.82	0.0199
Error	1.86	12	0.15		

Table 18. Type of Blocks x Sex Marginal Means for Take/Tug/Pull

Type of Blocks	Sex	Time 1	Time 2	Time 3	Time 4
Large Hollow	M	0.08	0.10	0.08	0.03
	F	0.03	0.00	0.05	0.03
Unit	M	0.08	0.03	0.15	0.33
	F	0.08	0.08	0.08	0.03

Teacher-directed behavior. There were no differences between type of blocks x sex x time for Call Teacher and Get Teacher as reported in Tables 19 and 20. Neither sex was more likely to call for the teacher or to go get the teacher. The children exhibited similar behavior for these two variables during unit and large hollow block play.

Teacher Intervention Behavior

As reported in Tables 21 and 22, there were no differences or interactions between types of blocks over time. The teacher or teacher's aide intervened during the children's unit block play as often as during their large hollow block play. This was true for both teacher intervention variables. Sex differences were not reported because of the score on each variable was the number of interventions for the group as a whole, not the number of interventions by a particular child.

Summary

The findings indicated that the children in this study (1) engaged in more group play with large hollow blocks and in more parallel and solitary play with unit blocks, (2) spent more time playing with large hollow blocks, and (3) exhibited similar social behaviors with both types of blocks

Table 19. Summary ANOVA Table for Call Teacher

SV	SS	DF	MS	F	P
Type of Blocks	0.003	1	0.003	0.29	0.6213
Error	0.04	4	0.01		
Sex	0.03	1	0.03	1.38	0.3046
Error	0.08	4	0.02		
Type of Blocks x Sex	0.003	1	0.003	0.29	0.6213
Error	0.04	4	0.01		
Time	0.08	3	0.03	1.38	0.2949
Error	0.24	12	0.02		
Sex x Time	0.03	3	0.01	0.47	0.7100
Error	0.29	12	0.02		
Type of Blocks x Time	0.01	3	0.003	0.29	0.8348
Error	0.13	12	0.01		
Type of Blocks x Sex x Time	0.01	3	0.003	0.29	0.8348
Error	0.13	12	0.01		

Table 20. Summary ANOVA Table for Get Teacher

SV	SS	DF	MS	F	P
Type of Blocks	0.05	4	0.05	0.23	0.6541
Error	0.86	4	0.21		
Sex	0.01	1	0.01	0.03	0.8700
Error	1.64	4	0.41		
Type of Blocks and Sex	0.11	1	0.11	1.26	0.3239
Error	0.36	4	0.09		
Time	0.13	3	0.04	0.22	0.8812
Error	2.28	12	0.19		
Sex and Time	0.86	3	0.29	1.86	0.1904
Error	1.86	12	0.15		
Type of Blocks and Time	0.58	3	0.19	0.96	0.4427
Error	2.39	12	0.20		
Type of Blocks, Sex and Time	0.36	3	0.12	0.63	0.6083
Error	2.29	12	0.19		

Table 21. Summary ANOVA Table for Teacher-Content

SV	SS	DF	MS	F	P
Type of Blocks	2.11	1	2.11	1.52	0.2857
Error	5.58	4	1.39		
Time	5.93	3	1.98	1.32	0.3120
Error	17.89	12	1.49		
Type of Blocks x Time	4.86	3	1.62	0.50	0.6897
Error	38.95	12			

Table 22. Summary ANOVA Table for Teacher-Behavior

SV	SS	DF	MS	F	P
Type of Blocks	0.01	1	0.01	0.24	0.6483
Error	0.21	4	0.05		
Time	0.30	3	0.10	0.61	0.6238
Error	1.98	12	0.17		
Type of Blocks x Time	0.44	3	0.15	1.02	0.4188
Error	1.71	12	0.14		

although the behaviors usually occurred more frequently with large hollow blocks. No sex differences were found in the levels of social participation, social behavior, or in the amount of time these children spent with each type of blocks. Boys were as likely to call for or get the teacher as were girls for both types of block play. The teacher intervened almost equally during both types of block play to take care of behavior problems or to comment on the children's structures or other aspects of their block play.

The results of the analysis of all the variables over time and their interactions were discussed. It was suggested that care be taken when interpreting these findings because many of these variables occurred very infrequently. In addition, because such a large number of variables (39) was analyzed at a .05 significance level, there is a strong possibility that two of these significant interactions are the result of chance for each ANOVA.

CHAPTER V
DISCUSSION

Despite the fact that both unit and large hollow blocks have traditionally been popular kindergarten materials, little is known about the social behavior that occurs while children play with these two types of blocks. The purpose of this study was three-fold: 1) to describe the levels of social participation and the social behavior of 20 kindergarten children during block play, 2) to compare the children's levels of social participation and social behavior occurring during large hollow block play and unit block play, and 3) to investigate the sex differences in the levels of social participation and social behavior of kindergarten children occurring during unit and large hollow block play. It is hoped that the information gathered in this investigation will 1) aid teachers in making curriculum decisions relevant to the social development of their kindergarten students and 2) stimulate interest in future investigation into the relationships between block play and the social development of young children.

Summary of Findings

A mixed-SES and mixed-race sample of 20 kindergarten children, 10 boys and 10 girls, was observed while playing with unit and large hollow blocks. The subjects were assigned by the teacher to five groups, each consisting of two boys and two girls. These groups remained intact for the entire study. Each child was observed four different times with each type of blocks for a total of 60 minutes. Although they were encouraged to enter the block area during the observation periods, the children could leave the block area and return whenever they wished. Children also could choose not to come to the block area if they so desired.

The findings from this study help provide answers to the five questions posed in Chapter I. Those questions are summarized in the four areas of discussion outlined below.

1. What levels of social participation occur as kindergarten children play with unit and large hollow blocks?

All levels of social participation occurred during both types of block play with the exception of Inside Structure, which is only applicable to large hollow blocks. With large hollow blocks Group occurred about 57% of the time while Inside Structure, Parallel, Solitary, and Onlooker were observed between 6% and 7% of the time. Unoccupied was recorded 2% of the time and Not Present accounted for the remaining 14% of observation time.

For unit blocks, Group play was observed 34% while Solitary and Parallel play were recorded 14% and 12% of the time. Onlooker and Unoccupied were observed for 4% and 1% of the unit block observation time while Not Present accounted for the remaining 32% of the time.

2. What social behaviors occur as kindergarten children play with unit and large hollow blocks?

Ask/Offer/Suggest, Playnoise, Smile, Talk, and Announce were the social behaviors that occurred most frequently for unit and large hollow blocks. Apologize, Cry/Scream, Pout, Hit at, Reject, and Fight were least likely to occur with either type of blocks. No Fights were observed while the children played with either type of blocks and Apologize, Pout, Hit at, and Reject were never recorded during unit block play. Nine behaviors--Imitate/Take Turns, Accept, Laugh, Refuse/Deny/Negate, Blame/Complain/Condemn, Command, Help, Give, and Receive--occurred on the average of one or two times per 7 1/2 minute observation. Eight other behaviors occurred an average of less than once per observation. These behaviors were Threat, Take/Tug/Pull, Frown, Touch, Hit/Push, Throw, Rough and Tumble, and Comfort/Praise.

3. What are the differences and similarities between a) the levels of social participation, b) the block area participation, and 3) the social behavior of kindergarten children as play with unit blocks and large hollow blocks?

Children were more likely to engage in Group play or be scored as Inside Structure or Unoccupied with large hollow blocks than unit blocks. However, the children were observed significantly more often in Solitary and Parallel play with unit rather than large hollow blocks. Furthermore, the children spent more time with large hollow blocks than with unit blocks as indicated by the significant difference in the Not Present category. Accept, Apologize, Ask/Offer/Suggest, Laugh, Refuse/Deny/Negate, Smile, and Talk were all observed significantly more often during large hollow block play than unit block play.

4. What are the sex differences for levels of social participation, block area participation, and social behavior for unit blocks and large hollow blocks?

There were no significant sex differences in the levels of social participation, block area participation, or social behavior of these kindergarten children for either type of blocks. Girls spent approximately the same amount of time playing with blocks as boys did. Both sexes were present more often in the large hollow block area than the unit block area.

Discussion

The findings from this study indicate that kindergarten children engaged in a great range of social behavior and in all levels of social participation during large hollow and unit block play. Large hollow blocks were preferred over unit blocks when time spent in the block area was used to measure children's preference.

These results also revealed children engaged in solitary, parallel, and group play with both types of blocks. They were more likely to participate in group play with large hollow blocks but unit blocks offered a greater opportunity for solitary and parallel play. Several social behavior variables (Accept, Apologize, Ask/Offer/Suggest, Refuse/Deny/Negate, Talk, Smile) occurred significantly more often during large hollow block play. This was probably because 1) children spent more time playing with large hollow blocks and 2) the greater occurrence of group play with large hollow blocks increased the likelihood of certain social behaviors occurring more frequently.

Discussion of Levels of Social Participation

The results from this study appear to indicate that one might expect group play to occur frequently with large hollow blocks. Unit blocks may provide children with the

opportunity to engage in group, parallel, or solitary play. The high incidence of group play with both types of blocks may also suggest that the children in this study were highly social. The socio-emotional climate of this classroom certainly encouraged group interactions.

Group play may occur more frequently with large hollow blocks because their size and weight encourages children to build together. Additionally, the small number of blocks (60 to 70) in a standard set creates a supply and demand dilemma that must be solved cooperatively if structures are to be built with the large hollow blocks. Conversely, unit blocks would seem to encourage more solitary and parallel play because they are easily manipulated by one child and a set usually contains more than enough blocks for several children to build independent structures simultaneously.

Social Participation

Not Present accounted for 14% of the large hollow block observation time and 32% of the unit block observation time. As a measure of interest, these figures may be misleading because Not Present was scored during any period of time when children left a block area. This included times when the children went to the bathroom, were called by a friend, or had to clean up before the observation ended. In these situations the child may have wanted to continue to play with blocks. Thus the level of interest may have actually been higher than the data indicated.

The amount of time spent with large hollow blocks as compared to unit blocks may indicate that large hollow blocks are a more interesting material. However, it may also indicate that children were seeking the chance for group play and not the particular material. A less congenial or less socially competent group of children may have spent more time with unit blocks than the children in this study did. The fact that large hollow blocks were outside while unit blocks were inside also may have accounted for the differences in participation.

Social Behavior

Seven of the 14 social behavior variables occurring an average of at least once each seven and one-half minute observation period could be thought of as prosocial (Ask/Offer/Suggest, Smile, Imitate/Take Turns, Accept, Laugh, Help, and Give), while only three (Refuse/Deny/Negate, Blame/Complain/Condemn, and Command) could be classified as antisocial. The other four (Playnoise, Talk, Announce, and Receive) are certainly not negative behaviors but may be thought of as neutral. The larger number of prosocial behaviors exhibited by the children during both types of block play, may have been a result of this particular sample of children and their teacher. This teacher had

established a very positive social climate in her classroom. Consequently, a group of children in a different classroom environment might exhibit a higher level of social behavior.

Despite the positive social climate and the possibility that this is an extremely prosocial group of children, informal observation during other periods of the school day indicated evidence of antisocial behavior during other activities. Therefore, the extremely low occurrence of these antisocial behaviors (Cry/Scream, Fight, Hit at, Hit/Push, Take/Tug/Pull, and Threat) suggest that block play may encourage positive social development through prosocial behavior.

Furthermore, three of the five most frequently occurring social behavior variables were verbal behaviors (Ask/Offer/Suggest, Talk, and Announce). This suggests that block play may provide a meaningful context for practicing language and communications skills. Investigation into the nature and function of the language of young children and its relationship to social development is needed.

Sex Differences

Although this study found no sex differences in the amount of time the children played with blocks or in the levels of social participation, the children appeared to

play most frequently in same-sex dyads. Moreover, the boys and girls utilize the blocks differently. The boys spent more time building with blocks and frequently did not play with their construction. Playing with the structure, not building it, appeared to be the primary focus of the girls. Kinsman and Berk (1979) also reported that although boys and girls spent equal time playing with blocks they utilized them in different ways.

The lack of sex differences in these children's social behavior may be a result of the composition of the groups (two boys and two girls). Children's social behavior in same-sex groups may differ from those in mixed-sex groups. Further investigation into the relationship between the sex composition of children's play groups and their social behavior is needed.

The following section presents additional suggestions for further research. These suggestions are drawn from the methodology, the findings, and discussion of the present study.

Suggestions for Further Research

A need exists for further research into the area of social development and its importance to the overall development of the kindergarten child. The present study focused on the social behavior of kindergarteners during

unit and large hollow block play. During the process of conducting this study many questions arose which need to be investigated more thoroughly.

The behavior observed in this study was generally prosocial and relatively peaceful; however, social conflict situations were not uncommon. Although the children exhibited a good deal of antisocial behavior during some of their conflicts, they usually worked out a mutually agreeable solution without the aid of the teacher. These conflict situations raise several interesting questions which may be answered by further investigation. Do children need to engage in some antisocial behavior to promote positive social development? When should the teacher intervene during a conflict situation? Should the teacher intervene at all? Do children need conflict experiences to ensure proper social development?

The assignment of children to groups raises some questions for future study. As part of the methodology of the present study, children were assigned to mixed-sex groups in order to control for the effect of the group on the behavior of individual children. These groups appeared to have some influence on the forming of new friendships and on the development of a sense of comradeship or group camaraderie. The groups also ensured the girls of equal access to the block areas. The idea of a teacher-

imposed play group was philosophically contrary to the educational practices of this classroom, yet, for many children, it appeared to provide the means for equal rights to blocks, new friends, and a sense of belonging to a special group. Questions need to be raised and investigated in regard to assigning children to teacher-selected play groups and to the influence of these groups on the social behavior of the child.

Another area of additional study was suggested by the methodology. The methodology of the present study was well suited for the observation of children engaged in block play activities. It is very possible this procedure could be adapted to study kindergarten or preschool children's social behavior during other play activities and with other play materials. There is a need for additional knowledge in this area to provide teachers with information necessary to make curriculum decisions regarding the appropriateness of certain activities and materials for individual children.

Finally, further research is needed to discover more about the social behavior observed in this study during block play and its relationship to the social development of the kindergarten child. The small sample size of the present study and the dearth of research in these areas would suggest that larger samples of children from several classrooms need to be observed playing with blocks over an

entire school year. This would provide a more thorough understanding of the social behavior of boys and girls during large hollow and unit block play. This design will also help answer questions about possible teacher effect and the lack of sex differences found in the present study. The following section discusses implications for kindergarten teaching derived from this study. It presents the teacher with suggestions for instruction and curriculum development.

Implications for Kindergarten Teaching

The implications for kindergarten teaching that may be derived from this study are based on the premise that the area of social development is an integral part of the kindergarten curriculum. Hymes (1968) supported this premise and emphasized the importance of providing opportunities and experiences to promote social growth in the kindergarten child. The findings of this study, when examined in conjunction with other studies in this area, suggest that kindergarten teachers should 1) provide time for block play, 2) have both unit and large hollow blocks in their classroom, and 3) provide girls with encouragement to play with blocks. These suggestions will be discussed below.

The recent trend of emphasizing readiness skills may mean there is less time available for activities in the

area of social development. These activities are important to the overall development and social adjustment of the young child (Elkind, 1979). The goal of kindergarten should be to educate the "whole child" and this can only be accomplished by a balanced curriculum which includes opportunities for cognitive, affective, motor, and social development (Hymes), 1968). The current study indicates block play is an activity which can probide opportunities for positive social interactions. Block play may provide the less socially competent child with the opportunity to play near other children in a parallel fashion, thus offering the child the chance to observe and imitate more socially competent peers. Eventually the youngster might become involved in group play when he/she feels secure enough to do so. At the same time block play allows the socially more competent child the choice of playing in a group, parallel, or solitary manner, depending on his/her needs at the time.

In addition to the opportunity for children to engage in all three levels of social play, the findings from this study indicated a low occurrence of antisocial behavior during block play. No fights were observed. Such behavior as grabbing another's blocks, threatening, hitting, and throwing blocks rarely occurred. Prosocial behavior such

as smiling, helping, taking turns, and asking (as opposed to commanding) occurred more frequently.

A common excuse of teachers for not using blocks is that there is so much antisocial behavior during block play. Although this was not true for the present study, it may be the case for certain groups of children in some classrooms. The present study, however, represents the potential of block play as a medium for positive social development. The importance placed on prosocial behavior by the teacher through modeling and reinforcement and the warm, secure atmosphere of the classroom most certainly had some effect on the children's social behavior observed during block play. The findings of the present study, however, are consistent with the findings of Bender (1978), who also found children engaged in mostly positive social behavior when they had an adequate number of blocks with which to play.

The present study and three other investigations (Bender, 1978; Massey, 1970; Parten, 1933) found that children engaged in solitary, parallel, and group play with blocks. All three levels of play are important for the social development of the young child (Moore et al., 1974; Roper & Hinde, 1978; Rubin, 1976). Parallel play provides the context for the emergence of the later development of peer social realtions (Mueller & Brenner,

1977). Group play provides the opportunity for meaningful social interaction in what the child views as a relevant social context.

Therefore, the availability of both types of blocks is suggested because it gives children the opportunity to engage in all levels of social play. Solitary and parallel play are most likely to occur with unit blocks. The children have more opportunity to practice their social interaction skills with large hollow blocks because group play occurs more frequently with them. Since large hollow blocks seem to be the most popular with children, they will probably spend more time engaged in block play using them, consequently providing more time for social interaction.

Unit blocks are recommended for the kindergarten classroom to ensure the opportunity for solitary, parallel, and group play. Large hollow blocks are suggested because of their popularity and the greater chance of group play occurring. Little antisocial behavior is likely to happen during either type of block play if an adequate supply of blocks and enough space to build is provided by the teacher. The block literature suggests about 500 unit blocks and 70 large hollow blocks for an average kindergarten class (Hirsch, 1974; Starks, 1960). A final suggestion is that teachers may need to provide some encouragement for girls to play with blocks.

The findings from this and other recent studies (Brenner, 1976; Kinsman & Berk, 1979) revealed that girls chose to play with blocks as often as boys did. However, other recent studies indicated that boys played more frequently with blocks than girls did (Beeson & Williams, 1979; Rubin, 1977). The results from Varma's (1980) study suggested that provisions should be made to ensure boys and girls an equal opportunity to play with blocks. Although Varma initially reported that boys played more frequently with blocks than girls did, she later found that girls spent more time with blocks after they were given equal access to blocks by doubling the number of blocks and opening a new block area. Similarly, in the present study, where equal access was assured through mixed-sex grouping of children, no sex differences were found for the amount of time children spent in the two block areas. Apparently, it is important to be aware that the possibility of the boys dominating the blocks may necessitate implementation of measures to ensure girls equal access to the block areas.

In summary, providing boys and girls with an equal opportunity to play with large hollow and unit blocks may offer them the chance to engage in positive solitary, parallel, and group play in a meaningful social context. Care should be taken to provide the children with an

adequate supply of blocks and an area large enough for a small group of children to play with their structures. Finally, some form of encouragement from the teacher may be necessary to allow girls equal access to blocks.

Conclusion

The aim of kindergarten is to educate the "whole child" by providing a well-balanced curriculum which includes materials and activities that promote cognitive, affective, motor, and social development (Hymes, 1968). The recent trend of emphasizing readiness skills may mean there is less time for activities related to social development. The exclusion of play activities is contrary to the social development theories of Isaacs (1974), Piaget (1962), and Smilansky (1968) and conflicts with the kindergarten curriculum advocated by Hymes (1968). The findings of the present study suggest that unit and large hollow block play provides a medium for positive social interaction. Furthermore, boys and girls behave similarly in block play which provides them the opportunity to engage in solitary, parallel, and group play. The small sample used for the present study added to the lack of

research on the relationship of blocks and other play materials to social development, would suggest a need for further investigation.

The following are suggestions for further research derived from the present study:

-- replication of this study using a larger sample from several different classrooms;
-- an investigation into the language of children that occurs during block play and its relationship to social development;
-- an investigation into the social behavior of mixed- and same-sex groups of children;
-- an investigation into the social conflict situations of young children playing with blocks and other play materials;
-- an investigation into the effect of teacher intervention on children's social problem solving;
-- an investigation into the relationship of teacher-assigned play groups to social behavior;
-- an investigation into the behavior of children as they play with a variety of play materials;

-- an investigation into the relationship between the specific social needs of a child and specific play materials that may help meet those needs;
-- an investigation into the effects of block play on social development.

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APPENDIX A
OBSERVATIONAL CHECKLIST

Child _____

Oate _____

Time _____

Observer _____

Large Hollow Blocks _____ Unit Blocks _____

SOCIAL ANO BLOCK AREA PARTICIPATION

OTHER BEHAVIOR:

SOLITARY		ONLOOKER	
PARALLEL		UNOCCUPIED	
GROUP		NOT PRESENT	
INSIOE STRUCTURE			

VERBAL

COMMANO		ASK/OFFER/ SUGGEST	
BLAME/COMPLAIN/ CONDEMN		APOLOGIZE	
REFUSE/OENY/ NEGATE		ACCEPT	
TALK		ANNOUNCE	
THREAT		COMFORT/PRAISE	

ACTION

HIT AT		HELP	
HIT/PUSH		TOUCH	
FIGHT		ROUGH ANO TUMBLE	
REJECT		RECEIVE	
TAKE/TUG/ PULL		GIVE	
THROW		IMITATE/ TAKE TURNS	

FACIAL EXPRESSIONS ANO VOCALIZATIONS

CRY/SCREAM		LAUGH	
FROWN		SMILE	
POUT		PLAYNOISE	

TEACHER-OIRECTEO ANO TEACHER INTERVENTION

CALL TEACHER		GET TEACHER	
TEACHER-BEHAVIOR		TEACHER-CONTENT	

APPENDIX B
SUMMARY TABLE OF CELL MEANS AND STANDARD DEVIATIONS FOR ALL DEPENDENT VARIABLES

Oependent Variable		Boys--Large Hollow				Boys--Unit				Girls--Large Hollow				Girls--Unit				Grand Mean
		T_1*	T_2	T_3	T_4	T_1	T_2	T_3	T_4	T_1	T_2	T_3	T_4	T_1	T_2	T_3	T_4	
Solitary																		
	$\bar{X}$**	1.70	0.20	2.40	0.50	4.90	4.00	6.90	3.60	1.40	1.60	4.00	0.50	3.50	1.80	4.10	5.80	2.93
	SD	0.27	0.27	3.83	0.71	2.81	5.34	4.57	3.45	1.91	1.39	2.89	0.50	6.46	1.44	2.53	4.74	
Parallel																		
	$\bar{X}$	2.10	3.30	0.80	0.90	3.90	3.50	4.80	5.00	2.50	3.10	1.50	1.60	2.90	4.00	2.90	2.30	2.82
	SO	1.88	3.19	1.30	1.08	4.86	5.50	4.10	4.29	2.85	2.27	1.70	2.07	1.95	4.18	1.98	1.52	
Group																		
	$\bar{X}$	15.50	17.00	18.10	18.60	8.10	5.50	11.00	13.50	17.30	17.40	15.80	16.30	10.40	14.80	11.00	10.60	13.81
	SO	5.73	7.49	5.55	4.20	8.19	5.97	6.41	10.30	9.46	4.46	4.40	9.16	9.36	10.59	6.20	8.32	
Onlooker																		
	$\bar{X}$	2.20	1.80	1.30	1.10	0.90	1.10	1.60	1.80	1.10	2.50	3.30	0.50	1.50	1.50	0.70	1.10	1.50
	SD	1.35	1.20	0.84	1.08	1.47	0.96	1.47	2.14	1.08	3.12	3.62	0.50	1.41	1.22	0.75	1.67	
Unoccupied																		
	$\bar{X}$	0.80	0.30	0.50	0.10	0.50	0.10	0.20	0.20	0.30	0.50	0.90	0.20	0.40	0.20	0.20	0.40	0.36
	SO	0.84	0.45	0.61	0.22	0.71	0.22	0.27	0.27	0.27	0.61	1.08	0.27	0.89	0.27	0.27	0.54	
Inside Structure																		
	$\bar{X}$	2.10	3.60	1.70	2.90	0.00	0.00	0.00	0.00	1.30	1.20	1.90	2.60	0.00	0.00	0.00	0.00	1.08
	SD	1.43	2.48	1.99	3.68	0.00	0.00	0.00	0.00	1.35	1.04	2.68	5.81	0.00	0.00	0.00	0.00	
Not Present																		
	$\bar{X}$	3.10	3.50	4.20	5.20	11.80	15.70	4.50	5.30	5.10	2.10	2.10	8.00	11.70	7.00	10.70	8.40	6.78
	SD	5.82	6.19	6.17	6.58	8.90	10.41	4.95	5.91	6.57	2.10	2.07	9.78	10.88	9.71	6.11	4.34	
Accept																		
	$\bar{X}$	1.10	2.10	1.90	2.50	0.50	0.10	0.30	1.20	3.00	2.40	2.30	1.60	1.60	2.30	1.00	1.00	1.56
	SD	0.96	1.52	0.96	1.54	0.61	0.22	0.27	1.04	2.26	1.92	2.41	1.98	2.75	1.79	0.61	1.17	
Announce																		
	$\bar{X}$	4.50	5.50	3.10	3.00	2.60	0.90	3.10	3.80	2.70	2.40	2.60	3.20	1.40	2.20	4.30	2.60	2.99
	SD	2.29	4.26	1.34	1.87	1.67	0.96	2.04	1.15	1.72	1.75	0.89	2.80	1.08	1.20	4.04	2.94	

Dependent Variable		Boys--Large Hollow				Boys--Unit				Girls--Large Hollow				Girls--Unit				Grand Mean
		T_1	T_2	T_3	T_4	T_1	T_2	T_3	T_4	T_1	T_2	T_3	T_4	T_1	T_2	T_3	T_4	
Apologize	$\bar{X}$	0.00	0.00	0.10	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.03
	SD	0.00	0.00	0.22	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00	
Ask/Offer/Suggest	$\bar{X}$	7.40	9.80	6.00	10.10	2.50	3.90	4.40	7.80	6.90	8.10	6.50	8.10	5.50	8.90	5.40	4.70	6.63
	SD	2.13	3.75	3.12	3.31	1.27	4.71	1.43	5.77	6.78	2.61	3.39	5.41	6.60	5.98	5.35	3.53	
Blame/Complain/ Condemn	$\bar{X}$	1.20	2.10	1.70	1.50	1.60	0.20	1.50	1.40	2.30	1.60	1.20	1.50	1.90	1.10	1.10	0.80	1.42
	SD	0.27	1.56	1.92	0.87	1.81	0.27	0.94	1.24	2.11	1.64	1.44	1.12	2.86	1.19	0.65	1.09	
Comfort/Praise	$\bar{X}$	0.20	0.10	0.00	0.10	0.00	0.20	0.00	0.10	0.00	0.30	0.00	0.00	0.00	0.10	0.00	0.00	0.69
	SD	0.27	0.22	0.00	0.22	0.00	0.45	0.00	0.22	0.00	0.27	0.00	0.00	0.00	0.22	0.00	0.00	
Command	$\bar{X}$	1.60	1.80	1.20	1.70	0.60	0.30	0.80	0.70	0.80	0.70	1.30	1.90	0.20	0.50	0.80	0.50	0.96
	SD	1.88	1.75	0.76	1.30	0.82	0.45	1.04	0.57	0.67	0.84	1.15	1.67	0.45	0.50	1.04	0.61	
Refuse	$\bar{X}$	1.30	1.90	1.80	1.70	0.60	0.40	1.10	0.90	2.20	1.40	2.10	2.40	0.80	1.50	1.00	1.20	1.40
	SD	1.60	1.02	0.57	1.44	0.65	0.65	0.82	0.74	1.52	0.42	0.96	1.95	0.97	1.46	0.79	0.67	
Talk	$\bar{X}$	5.40	3.80	3.10	4.10	2.30	1.70	2.50	4.00	3.30	5.20	5.00	3.30	0.90	2.90	2.70	1.60	3.24
	SD	3.94	2.97	3.31	4.08	2.95	2.54	2.67	3.98	3.53	4.75	5.16	3.85	0.41	3.78	1.60	0.89	
Threat	$\bar{X}$	0.70	0.40	0.40	0.30	0.20	0.20	0.30	0.20	0.40	0.20	0.40	0.30	0.00	0.40	0.20	0.30	0.31
	SD	0.84	0.65	0.42	0.27	0.45	0.27	0.45	0.27	0.65	0.45	0.42	0.44	0.00	0.42	0.27	0.45	
Give	$\bar{X}$	1.70	0.80	1.20	0.40	0.90	0.20	1.70	1.10	1.10	1.60	0.50	0.30	0.60	0.80	0.90	0.60	0.90
	SD	2.16	1.04	0.76	0.55	1.34	0.27	1.72	1.08	1.19	1.29	0.50	0.27	0.55	0.76	0.89	1.08	

Dependent Variable		Boys--Large Hollow				Boys--Unit				Girls--Large Hollow				Girls--Unit				Grand Mean
		T_1	T_2	T_3	T_4	T_1	T_2	T_3	T_4	T_1	T_2	T_3	T_4	T_1	T_2	T_3	T_4	
Fight	$\bar{X}$	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Help	$\bar{X}$	0.90	0.80	0.60	1.00	0.30	0.60	1.80	0.30	0.90	1.20	2.40	0.90	0.20	0.80	0.10	0.20	0.81
	SD	0.82	0.27	0.89	1.00	0.27	1.08	1.68	0.27	0.74	0.83	4.29	0.65	0.27	0.91	0.22	0.45	
Hit at	$\bar{X}$	0.10	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.02
	SD	0.22	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.00	0.00	0.00	
Hit/Push	$\bar{X}$	0.30	0.00	0.10	0.10	0.20	0.00	0.00	0.00	0.40	0.10	0.20	0.00	0.00	0.10	0.00	0.00	0.09
	SD	0.67	0.00	0.22	0.22	0.45	0.00	0.00	0.00	0.55	0.22	0.45	0.00	0.00	0.20	0.00	0.00	
Imitate/Take Turns	$\bar{X}$	0.50	0.90	2.60	3.10	0.50	0.30	1.00	0.10	1.40	1.90	2.70	4.20	0.10	1.20	1.00	0.90	1.40
	SD	0.35	0.82	2.04	4.83	0.61	0.67	0.71	0.22	1.08	1.29	2.11	4.75	0.22	0.91	1.00	1.24	
Receive	$\bar{X}$	0.50	0.70	0.60	0.50	0.20	0.10	1.30	0.70	1.40	0.40	0.90	0.40	1.10	0.50	0.10	0.20	0.60
	SD	0.50	0.57	0.65	0.71	0.45	0.22	1.72	0.76	2.04	0.55	0.65	0.55	1.52	0.35	0.22	0.27	
Reject	$\bar{X}$	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.01
	SD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00	
Rough and Tumble	$\bar{X}$	0.10	0.20	0.20	0.20	0.00	0.10	0.00	0.00	0.00	0.10	0.00	0.00	0.10	0.00	0.00	0.00	0.06
	SD	0.22	0.27	0.27	0.45	0.00	0.22	0.00	0.00	0.00	0.22	0.00	0.00	0.22	0.00	0.00	0.00	
Take/Tug/Pull	$\bar{X}$	0.30	0.40	0.30	0.10	0.30	0.10	0.60	1.30	0.10	0.00	0.20	0.10	0.30	0.30	0.30	0.10	0.30
	SD	0.45	0.42	0.67	0.22	0.45	0.22	1.08	1.25	0.22	0.00	0.27	0.22	0.67	0.45	0.67	0.22	

Dependent Variable		Boys--Large Hollow				Boys--Unit				Girls--Large Hollow				Girls--Unit				Grand Mean
		T_1	T_2	T_3	T_4	T_1	T_2	T_3	T_4	T_1	T_2	T_3	T_4	T_1	T_2	T_3	T_4	
Throw	$\bar{X}$	0.10	0.00	1.00	0.00	0.03	0.00	0.70	0.30	0.00	0.00	0.00	0.10	0.10	0.00	0.00	0.10	0.17
	SD	0.22	0.00	1.97	0.00	0.45	0.00	1.04	0.45	0.00	0.00	0.00	0.22	0.22	0.00	0.00	0.22	
Touch	$\bar{X}$	0.50	0.10	0.00	0.30	0.10	0.00	0.10	0.30	0.30	0.30	0.60	0.40	0.10	0.10	0.00	0.00	0.20
	SD	0.71	0.22	0.00	0.45	0.22	0.00	0.22	0.45	0.45	0.27	0.65	0.65	0.22	0.22	0.00	0.00	
Cry/Scream	$\bar{X}$	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.03
	SD	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.27	0.00	0.00	0.00	0.22	0.00	0.00	0.00	
Frown	$\bar{X}$	0.00	0.10	0.80	0.20	0.60	0.10	0.60	0.00	0.40	0.40	0.00	0.60	0.10	0.00	0.40	0.30	0.29
	SD	0.00	0.22	0.76	0.27	0.82	0.22	0.55	0.00	0.89	0.65	0.00	0.65	0.22	0.00	0.55	0.45	
Laugh	$\bar{X}$	0.80	2.80	1.50	1.40	0.50	0.40	0.40	0.50	2.70	3.20	2.00	2.10	0.30	1.10	1.40	1.40	1.41
	SD	0.45	2.97	1.27	1.38	0.50	0.65	0.42	0.50	1.85	2.41	1.97	2.53	0.45	1.47	1.29	1.52	
Playnoise	$\bar{X}$	6.30	8.70	5.60	5.70	4.80	4.90	9.70	9.30	3.40	4.20	5.30	4.80	2.80	2.40	4.00	6.40	5.52
	SD	5.45	5.94	2.77	2.46	3.67	5.05	3.58	3.98	2.97	3.70	7.27	3.88	2.71	2.81	2.52	3.80	
Pout	$\bar{X}$	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.10
	SD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.00	0.22	0.00	0.00	0.00	0.00	0.00	
Smile	$\bar{X}$	3.40	6.40	4.60	4.50	1.20	1.30	3.70	3.50	4.70	6.40	5.00	4.60	1.20	2.40	2.60	3.20	2.67
	SD	1.71	4.92	3.09	2.06	1.25	0.97	2.75	3.02	3.25	4.41	4.02	3.38	1.44	2.27	2.63	1.79	
Call Teacher	$\bar{X}$	0.00	0.00	0.10	0.10	0.00	0.00	0.10	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.03
	SD	0.00	0.00	0.22	0.22	0.00	0.00	0.22	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.00	

Dependent Variable		Boys--Large Hollow				Boys--Unit				Girls--Large Hollow				Girls--Unit				Grand Mean
		T_1	T_2	T_3	T_4	T_1	T_2	T_3	T_4	T_1	T_2	T_3	T_4	T_1	T_2	T_3	T_4	
Get Teacher																		
	$\bar{X}$	0.20	0.30	0.10	0.10	0.50	0.00	0.30	0.00	0.10	0.20	0.20	0.60	0.20	0.20	0.00	0.20	0.20
	SD	0.27	0.45	0.22	0.22	0.50	0.00	0.67	0.00	0.22	0.45	0.27	1.08	0.45	0.45	0.00	0.27	
Teacher--Behavior																		
	$\bar{X}$	0.30	0.00	0.10	0.20	0.00	0.20	0.30	0.00	0.30	0.60	0.20	0.00	0.40	0.00	0.40	0.20	0.20
	SD	0.67	0.00	0.22	0.27	0.00	0.45	0.67	0.00	0.45	0.65	0.27	0.00	0.42	0.00	0.89	0.27	
Teacher--Content																		
	$\bar{X}$	0.80	0.00	0.10	0.20	1.30	0.10	0.60	0.00	0.20	0.80	1.10	0.70	2.00	0.40	0.80	1.30	0.65
	SD	1.10	0.00	0.22	0.45	2.90	0.22	0.89	0.00	0.45	1.25	1.52	0.67	2.26	0.42	1.15	1.60	

*T_1 = First Observation
T_2 = Second Observation
T_3 = Third Observation
T_4 = Fourth Observation

**$\bar{X}$ = Cell Means
SD = Standard Deviation

BIOGRAPHICAL SKETCH

Dwight L. Rogers, III, was born on April 28, 1948, in Fort Lauderdale, Florida, and obtained his primary and secondary education there. He first attended the University of Florida in 1966, graduating in 1970 with a Bachelor of Science in journalism and in 1974 with a Master of Arts in education.

Dwight was a Teacher Corps Volunteer and taught in kindergarten and child care for five years. After entering graduate school he worked as a graduate instructor teaching courses in early childhood curriculum and art. In September, 1982, he will begin teaching at Ohio University in Athens, Ohio.

Dwight is married to Gail Gillespie Rogers and they have two children, Amy and Nora. His major outside interests include playing old time fiddle tunes with Gail and the Bucksnort Barndance Band and running several miles a day.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Linda L. Lamme

Linda L. Lamme, Chairperson
Associate Professor, General Teacher Education

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Dorene D. Ross

Dorene D. Ross, Cochairperson
Assistant Professor, General Teacher Education

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

James J. Algina

James J. Algina
Associate Professor, Foundations of Education

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Patricia T. Ashton

Patricia T. Ashton
Associate Professor, Foundations of Education

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Suzanne L. Krogh

Suzanne L. Krogh
Assistant Professor, General Teacher Education

This dissertation was submitted to the Graduate Faculty of the Division of Curriculum and Instruction in the College of Education and to the Graduate Council, and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

December, 1982

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Dean for Graduate Studies and Research